

# HYF



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PLA Films made  
**100%**  
from Plants

Your industry leader in  
PLA packaging solutions



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We are world leaders in the production of Polylactic Acid (PLA) films. Our PLA films are made 100% from annually renewable, carbon-absorbing PLANTS making the production cycle carbon-neutral. Bottles that are environmentally & eco friendly as they are made from natural resources, are chemical & toxin free, biodegradable, plastic free. A truly revolutionary packaging solution for our modern needs.



## WHY IS PLA ECO-FRIENDLY?

There are no toxic fumes during production. There are also no greenhouse gases or toxic fumes when the bottles are incinerated. PLA films can be composted, recycled or incinerated toxin-free; offering multiple end-of-life cycle options.

PLA films that do not contain PET, BPA or phthalates ensuring no hormone & toxic chemicals leach into it's contents.

Only 0.04% of the annual global corn crop is used to produce PLA, this means there is little to no impact on world food pricing. Future plans are already being put in place to use non-food based naturally thriving crops such as cassava.

PLA breaks down into water and carbon dioxide. It won't disintegrate or degrade while stored on shelves.

PLA films are energy-saving to produce. Because they're made from corn rather than petrochemicals, PLA films production requires significantly less energy.

In fact, producing PLA uses 65 percent less energy than your traditional plastics. It also generates some 65 percent fewer greenhouse gases and contains no toxins so there's nothing to release into the atmosphere, food, or leach into the soil.

## BOPLA FILMS

A new generation of biodegradable films giving a remarkable contribution to improving sustainability of modern packaging. And it's designed to cover a wide range of food and non-food packaging applications, using existing converting and packaging technologies.



Polymer	Product No.	Product category	Color	Application
PLA (TDO)	PLA-1011	Shrink	Transparent	Shrink sleeve Roll sleeve Wine capsule Pressure-sensitive
PLA	PLA-1021	Non heat sealable	Transparent	Food package Non-food packaging Self adhesive label Pressure sensitive label Wrap around label
PLA	PLA-1031	One side heat sealable	Transparent	
		Two side heat sealable	Transparent	

# PLA FILM

HYF Compostable Poly Lactic Acid (PLA) offers exceptional clarity and stiffness similar to traditional OPP. Certified for industrial composting, it also contains up to 100% renewable raw materials. It's a clear option for brands looking to improve the sustainability of their packaging.



HYF's compostable bio-based films are clear films made with renewable resources. Manufactured with polylactic acid (PLA) resin, the new, thin biaxially oriented Ecodear films deliver good moisture and oxygen permeability and a clear film for use as an inner seal layer or a printweb. Food packaging applications include frozen foods, snacks, cookies, cereal and nutrition bars, and confectionery items. Packaging for nonfood items includes personal care items, fashion accessories, promotional items, toys, office supplies, and other retail goods.



Why to choose our PLA film?

- Suitable for permeability films designed to maintain freshness and extend shelf-life of fresh produce
- Industrial compostable
- High moisture permeability: suitable for high respiring produce
- Available in a wide range of formats

Product	Tensile Strength (MPa)		Elongation (%)		Heat Shrinkage (%)		Haze (%)	Transmittance (%)	Gloss (%)	C.O.F (IN/OUT)		Wet Tension (mN/m)	Heat Sealing Strength (N/15mm)
	MD	TD	MD	TD	MD	TD				μS	μK		
HYF PLA Film (PLA-1021)	121	163	96	71	100°C/10min		0.4	94.2	87	0.65	0.61	48	0
					0.6	0							
HYF PLA Film (PLA-1031)- One Side Heat Sealable	125	140	126	111	100°C/10min		1.9	93.3	92	0.52	0.49	≥44	6.88
					3.9	0							
HYF PLA Film (PLA-1031)- Two Sides Heat Sealable	75	84	110	117	120°C/10S		0.7	93.5	80	0.55	0.57	≥36	4.61
					6	2.5							
Test Method	ASTM D882		ASTM D882		—		ASTM D1003	ASTM D1003	GB/T 8807 (45°)	ASTM D1894E		ASTM D2578	85°C/80°C /135Kpa/25

# PLA SHRINK FILM

PLA (polylactic acid) is a compostable bioplastic derived from renewable materials, it offers a very high shrinkage ratio and requires less heat to shrink, while delivering performances similar to the other films during processing.

Poly Lactic Acid (Polylactide)- film is made from renewable resources and is biodegradable. This type of material has high clarity and requires a lower activation temperature, and it is widely used to make a variety of shrink sleeve.



## Why to choose our PLA shrink film?

- Environmentally friendly and 100% compostable
- "Slow shrink" behaviour and very high maximum shrinkage ratio (77%)
- Advanced processing properties
- High transparency and good gloss, good ink adhesion

### Full Body

Full body sleeves can turn an ordinary container into an aesthetic work of art. Create an appealing design and watch your profits soar. We are proud to offer the PLA shrink film for Eco-Sleeve, an environmentally friendly option that removes unwanted products from the PET recycle stream.

### Tamper Evident Bands

Tamper evident bands not only protect your product from tampering, but they also provide a sense of safety for your customers. Most commonly found in the food and pharmaceutical industries, consumers now expect them on their products.

### Promotional

Offer specials, introduce limited editions, offer free gifts and more with promotional packaging. Easily cover up bar codes to offer alternative deals and to create greater marketing appeal.

### Multi-Pack

Multi-packs instantly give off the perceived image of a discount, and consumers love a bargain. It is easy to package multiples of the same or various sized products with one unique barcode. We are dedicated to providing eco-friendly solutions for all of your shrink labeling needs. Our dedication to customer service and innovation keeps us at the forefront of our industry. Contact us today with your current container or idea and we will show you the available options!

# PLA Films made 100% from Plants

Your industry leader in PLA packaging solutions

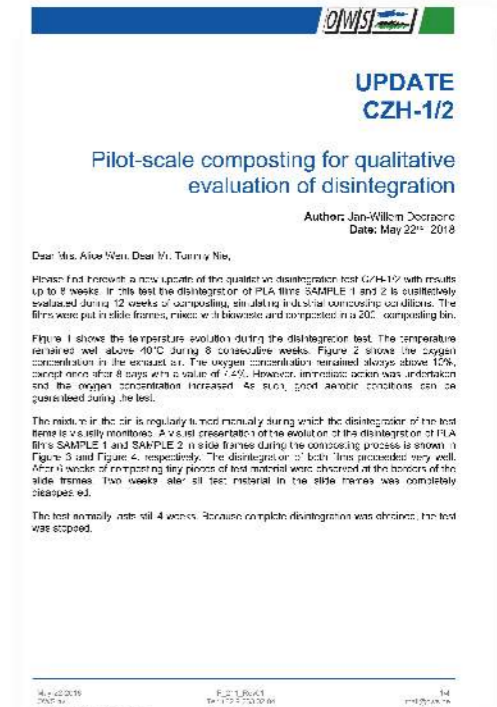


## CERTIFICATIONS

Biobased and industrially compostable packaging films

HYF'S PLAS films are certified industrially compostable according to EN 13432 by the TÜV AUSTRIA. It proves that a product is certified industrially compostable according to the European standard EN 13432. When successfully certified, the product will fully biodegrade in an industrial composting plant under controlled conditions such as temperature, moisture and time frame – leaving nothing behind but water, biomass and CO2.

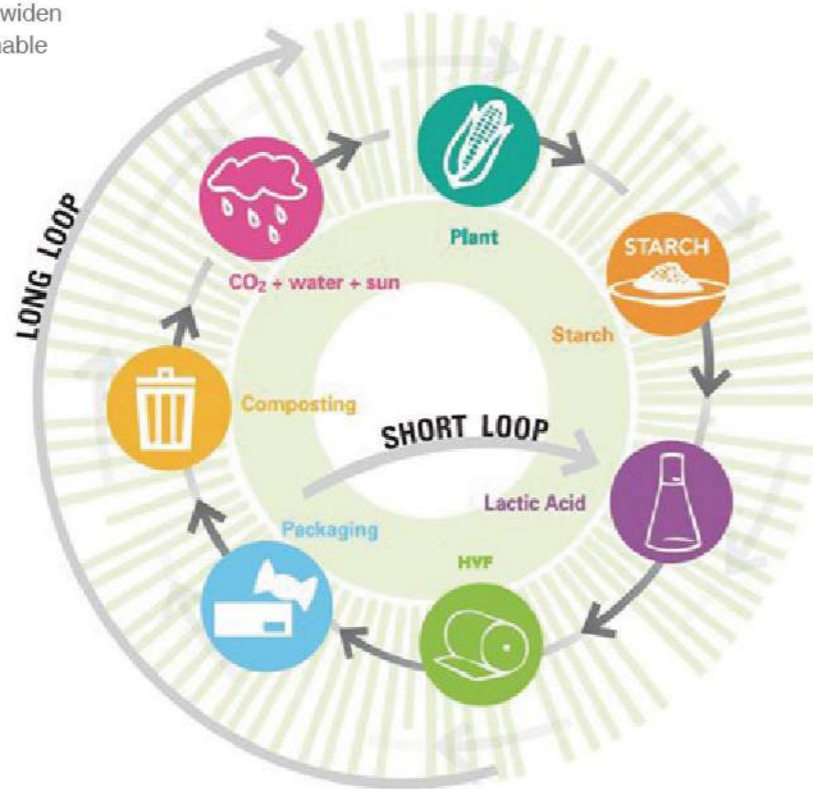
Product	Tensile Strength (MPa)		Elongation (%)		Heat Shrinkage (%)		Haze (%)	Transmittance (%)	Gloss (%)	C.O.F (IN/OUT)		Wet Tension (mN/m)	Heat Sealing Strength (N/15mm)
	MD	TD	MD	TD	MD	TD				μS	μK		
HYF PLA Shrink Film (PLA-1011)	59	118	4	65	8.6	76.9	0.7	96.9	81	0.48	0.47	≥36	7.47
Test Method	ASTM D882		ASTM D882		100°C/10S		ASTM D1003	ASTM D1003	GB/T 8807 (45°)	ASTM D1894E		ASTM D2578	Cyclohexanone 7.47



# RAW MATERIALS

HYF sustainable packaging films are made of 100% PLA

More compostable and sustainable packaging is a key measure to ensure our future. The dependency on crude oil and its impact on future developments made our team to widen its view towards a compostable, sustainable packaging.



HYF PLA films are made of PLA resin which Poly-Lactic-Acid is obtained from corn or other starch/sugar sources

- Plants grow by photo-synthesis, absorbing CO<sub>2</sub> from the air, minerals and water from the soil and the energy from the sun;
- The starch and sugar content of the plants is converted into lactic acid by microorganisms via a fermentation process;
- Lactic acid is polymerized and becomes poly-lactic acid (PLA);
- PLA is extruded into film and becomes flexible packaging;
- Flexible sustainable packaging is composted into CO<sub>2</sub>, water and biomass;
- Biomass is absorbed by plants, and the cycle continues.



## END OF LIFE OPTIONS

Besides landfill, HYF offers a range of environmentally-friendly alternatives

### Composting:

It is compostable under controlled conditions (T>58°C, rh>90%, presence of micro-organism), PLA will fully degrade into CO<sub>2</sub>, water and biomass;

### Mechanical Recycling:

PLA can be re-used after grinding, re-crystallisation and re-granulation;

### Chemical Recycling:

Possible when material will be returned to raw material manufacturer or others;

### Incineration:

PLA is 100% combustible, thus giving clean energy from waste.