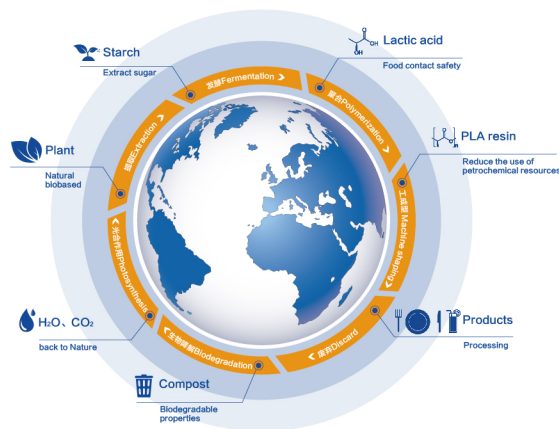


## INTRODUCTION OF REVODE®

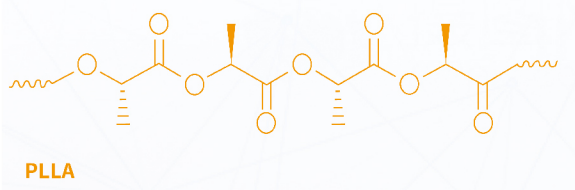
**REVODE®**PLA, made from starch-rich plants such as corn rather than oil, is a low-carbon functional material with superior processing properties.

**REVODE®**PLA is derived from renewable and resource-rich plants with short growth cycles.



## REVODE® DERIVED FROM NATURE

Carbon is absorbed from the atmosphere by plants through photosynthesis and stored as plant starch. Glucose is extracted from plant starch and then become food grade lactic acid by fermentation. The lactic acid is finally polymerized into PLA.



## APPLICATION OF REVODE®

**REVODE®**PLA is an alternative for most synthetic plastics and is suitable for extrusion, injection molding, blow molding, spinning, etc.

HISUN is the first company who has achieved the industrialization of PLA in China. Currently, **REVODE®** is widely used in packaging, tablewares, textiles, 3D printing and other applications for the purpose of global carbon emission reduction because of its excellent processability, biodegradability and food contact safety.

## ADVANTAGES REVODE®

### Come From Nature >>

- **REVODE®** is derived from natural renewable plant resources.
- **REVODE®** reduces the use of petrochemical resources.

### Environmental Advantage >>

- **REVODE®** has low carbon footprint and can reduce greenhouse gas emissions.
- **REVODE®** is fully biodegradable, it will “return” to nature and alleviate white pollution.

### Advantages after disposal >>

- Incinerable and the products are non-polluting.
- Landfill-able and free of leachate or toxic substances.
- Compostable and fully biodegradable.
- Recyclable and can be processed to monomer or other products.

### Processing Advantages >>

**REVODE®** Injection molding & Thermoforming

- Excellent transparency and glossiness.
- Excellent processing performance.
- Food-contact safety.
- First heat-resistant polymers

**REVODE®** Film

- Suitable for traditional diversified processes of thin film.
- Easy to blend in the blow film processing.
- Suitable for heat sealing and printing.
- Excellent composite processability of coating film.

**REVODE®** Fiber

- Excellent blending performance.
- Has the advantages of safety, moisture absorption, perspiration and better skin affinity.
- Good anti-ultraviolet performance
- Has the advantages of both natural fiber and chemical synthetic fiber.

**REVODE®** 3D Printing Filaments

- No irritating smell.
- Low shrinkage, forming without warping.
- Excellent anti-aging performance.
- High transparency, glossiness and toughness ,easy to color.

## STANDARDS AND CERTIFICATIONS OF REVODE®

### Food contact safety >>

**REVODE®** has been certified by the US Food and Drug Administration (FDA), which proves to be a reliable, safe and food-contactable products. The monomer of **REVODE®** is lactic acid, which is a commonly used as food additive.

### Bio-based >>

**REVODE®** is derived from biomass (non-GMO resource) and has passed the biomass certification of the Bioplastic Association of Japan.

### Comply with the Law on the Control of Chemical substances >>

**REVODE®** complies with the Law on the Control of Chemical substances of China, the United States, the European Union (REACH), Japan and other countries and regions.

### Industrial-compostable >>

**REVODE®** (except some customized grades) has been tested by the National Plastic Products Quality Supervision and Inspection Center of China, and certified by BPI in US and DIN CERTCO in Germany.



**REVODE®**

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**REVODE®**

**PLA**  
BIODEGRADABLE  
POLYLACTIC ACID

**REVODE®** Resin

Product Guidance >>

**HISUN**  
海正生物材料

# THE ORIGIN OF REVODE®

In 2004, Zhejiang Hisun Biomaterials Co., Ltd. successfully transformed the technological achievements of polylactic acid into industrial production capacity and became the pioneer of the industrial production of PLA, a fully biodegradable material in China. **REVODE®** polylactic acid resin has broken the plastic processing industry's dependence on traditional petroleum-based resins, and realized the vision of originated from nature and returning to nature.

## REVODE® Series » Extrusion/Thermoforming

- Extrusion

REVODE110	Its transparency, glossiness and mechanical properties are similar to those of PET, but its toughness is inferior to that of PET. It is easy to color and print, so it can be used in traditional extrusion equipment.
REVODE190	Its performance is similar to that of REVODE110, and its melting point is higher than that of REVODE110. It can also be used as basic material of high-end extrusion-use compounds.
REVODE721	It is a kind of compound with high heat resistance which is mainly used as non-transparent heat-resistant PLA thermoformed products with low stretching degree and fast production speed, such as cup lid and lunch box.

- Straw

REVODE711H	It is a kind of toughened compound which is specially designed to make straight-type straw for cold drink.
REVODE711B	It is a kind of toughened compound with excellent flexibility which is suitable for curve/U-type/art straws.
REVODE711S	It is a kind of toughened compound with high heat resistance which is specially designed to make straws for hot drink. It can bare the temperature around 75-80℃.

# INTRODUCTION OF REVODE®

	Extrusion Grade						Injection Grade					
Physical Properties	Test Standard	REVODE 110	REVODE 190	REVODE 721	REVODE 711H	REVODE 711S	REVODE 195	REVODE 210	REVODE 290	REVODE 213	REVODE 213S	REVODE 213T
Density g/cm³	GB/T1033.1-2008	1.20-1.30	1.20-1.30	1.30-1.40	1.25-1.35	1.30-1.40	1.20-1.30	1.20-1.30	1.20-1.30	1.40-1.50	1.40-1.50	1.30-1.40
Melt Index g/10min (190 C/2.16kg)	GB/T 3682.1-2018	3-12	2-12	3-10	3-10	3-10	3-10	12-40	12-40	10-25	10-25	8-15
Melting Point C	GB/T19466.3-2004	155~170	170~180	-	-	-	-	160~170	170~180	-	-	-
Glass Transition Temperature C	GB/T19466.2-2004	56~60	56~60	-	-	-	-	56~60	56~60	-	-	-
Mechanical Properties	Test Standard	Test Results										
Tensile Strength MPa	GB/T1040.1-2018	≥50	≥50	≥40	≥35	≥30	≥40	≥50	≥50	≥40	≥50	≥40
Elongation at Break%	GB/T1040.1-2018	≥3	≥3	≥4	≥200	≥40	≥30	≥3	≥3	≥3	≥3	≥3
Impact Strength kJ/ m²	GB T 1043.1-2008	≥2	≥2	≥3	≥5	≥3	≥2	≥2	≥2	≥2	≥2	≥2

## Injection »

- Used for injection molding products

REVODE210	It is transparent and has relatively high MFR(melt flow rate). Its performance is similar to that of REVODE110, and it often replaces AS/PS in injection molding.
REVODE290	It is transparent and has relatively high melting point. It can be used for transparent injection molding products, injection blow-pull products, or basic material of high-end compounds.
REVODE213	It is a compound resin with high heat resistance which is suitable for disposable injection products. It can bare the temperature more than 95℃. The toughness is average.
REVODE213S	It is a compound resin with high heat resistance and high gloss which is mainly used in injection household durable products.
REVODE213T	It is a compound resin with high heat resistance, its performance is similar to that of REVODE213S, but its toughness is better.
REVODE213TR	It is a compound resin with high heat resistance, its performance is similar to that of REVODE213T, but its anti-aging and anti-hydrolysis properties are better.

REVODE701	It is a toughened compound resin which is mainly used to make opaque stationery, toys and garden products. Its mechanical properties is similar to HIPS and it can be used for traditional ASB mold. It is non-food grade.
REVODE713	It is a toughened compound resin which is specially designed for injection comb handle. Its toughness is better than REVODE701 and it is non-food grade.

## Film »

- Used for blown film, laminating film and stretch film products.

REVODE110	It is a general grade, a base material for compound blown film or cast film.
REVODE101	It is a base material for compound blown film and it is used for film products requiring heat-sealing and high transparency.
REVODE201	
REVODE110/190	It is a base material for compound blown film and it is often used for starch compound film products, requiring to improve the transparency and heat sealing performance.
REVODE110/190	It can be used for extruding film and producing film-coated paper products, such as film-coated cups, bowls and other products.
	It can be used for BOPLA stretch film production.

## Fiber/Non-woven»

- Used for fiber processing, including monofilament, composite filament, spunbond and melt-blown non-woven products.
- Amorphous and crystalline grade with melting point ranging from 140℃ to 175℃.

REVODE110	It is used for staple fiber and spunbond non-woven products.
REVODE190	It is used for products requiring lower fiber shrinkage and higher dimensional stability.
REVODE210	It is used for melt-blown non-woven fabrics.

## Blowing »

- Used for extrusion blowing and injection blowing molding products

REVODE110	It is used to directly produce transparent extrusion blowing, injection blowing products.
REVODE219E	It is a toughened compound resin for injection blowing.
REVODE219C	It is a kind of heat resistant compound resin for injection blowing, which is used to make milk bottles, space cups and other products. Its performance is close to PCTG.

## 3D Printing »

- Used for manufacturing 3D printing filament.

REVODE110	It is a basic material specially designed for 3D printing compounding, has excellent printing effect, non-warping and low shrinkage. The printing process is non-toxic and odor-free.
REVODE195	It is a toughened compound resin, used for extrusion production of 3D printing filament, with stable filament output, good fluidity, toughness and gloss.