ANBIO

BIOPLASTICS MATERIALS

AGENDA

AN PHAT HOLDINGS OVERVIEW

ANBIO BIOPLASTICS MATERIALS

- Introduction
- Research & Development
- Production capacity
- Certificates
- Biodegradable materials

AN PHAT HOLDINGS OVERVIEW

HISTORY

2002

- Anh Hai Duy Limited as the precursor of An Phat Holdings was established

2005

- The first factory in Hai Duong came into operation

2009

- An Tien Industries was incorporated
- Stunning exports growth from EU, Asia, US

2010

- AAA was listed on HNX
- AAA products gained Japanese customers' attention

2017

- APH was founded
- #1 plastic packaging in SEA
- #1 plastic packaging Vietnam exporter

2018

- Market and product expansion
- Became the pioneer to establish high technology and environmentally friendly plastics value chain, developing sustainable enterprise ecosystem.

2019

- ANKOR became member of APH
- NHH was listed on HOSE
- APH affirmed moving toward green manufacturing with ANECO's market penetration.

2020

- IPO & listing APH on HOSE.
- Invest in new Projects.

VISION

The leading Group in high technology and environmentally friendly plastics in South East Asia

POSITIONING

Become the pioneer group to establish high technology and environmentally friendly plastics value chain, developing sustainable entrepreneurial ecosystem.

MISSION

Promote and support Vietnam’s plastic industry, enhance the image of high-tech and environmentally friendly made-in-Vietnam plastic products

ENTERPRISE ECOSYSTEM

PACKAGING

AN PHAT BIOPLASTICS
AN VINH PACKAGING

COMPOSTABLE COMPOUNDS & PRODUCTS

ANBIO
ANKOR BIOPLASTICS
AN PHAT BIOPLASTICS

MOLDING & PRECISION ENGINEERING

VMC

RAW MATERIALS & CHEMICALS FOR PLASTIC INDUSTRY

AN TIEN INDUSTRIES
AN THANH BICSOL

ENGINEERING & BUILDING MATERIALS PLASTICS

AN TRUNG INDUSTRIES
HPC SINCE 1972
AN CUONG BUIDING MATERIALS
VIEXIM

INDUSTRIAL REAL ESTATE & LOGISTICS

AN PHAT COMPLEX
AN TIN LOGISTICS

ACHIEVEMENTS

4 COMPANIES ON THE STOCK MAKET

13+ FACTORIES

15 COMPANIES

50+ COUNTRIES EXPORTED

500+ MILLION USD TURNOVER

ANBIO

WE
BUILD UP
A GREEN
FUTURE

As member of the group leading in the field of advanced technology and environment-friendly plastic production in SEA, we do understand the importance and our mission in the development of eco-friendly products. AnBio was established to realize An Phat Holdings' green strategy and sustainable development goals.

RESEARCH & DEVELOPMENT

With 2 R&D centers in Korea and Vietnam, we:

- ✓ **Conduct intensive research activities**
- ✓ **Hold many international patents**
- ✓ **Customize products according clients' requirements**

RESEARCH & DEVELOPMENT *(cont.)*

We invest in the

most modern

equipment

to ensure the

highest-quality

products

THERMAL ANALYSIS

TGA

DMA

DSC

TMA

RESEARCH & DEVELOPMENT *(cont.)*

CHROMATOGRAPH

GPC

GC

GC - MS

MECHANICAL PROPERITIES & OTHERS

Melt flow index tester

Constant temperature & humidity chamber

FT-IR

UTM

RESEARCH & DEVELOPMENT *(cont.)*

SYNTHESIS

Biodegradable foam test

Pilot – 20L

Biodegradability test system

Pilot line – 100L

RESEARCH & DEVELOPMENT *(cont.)*

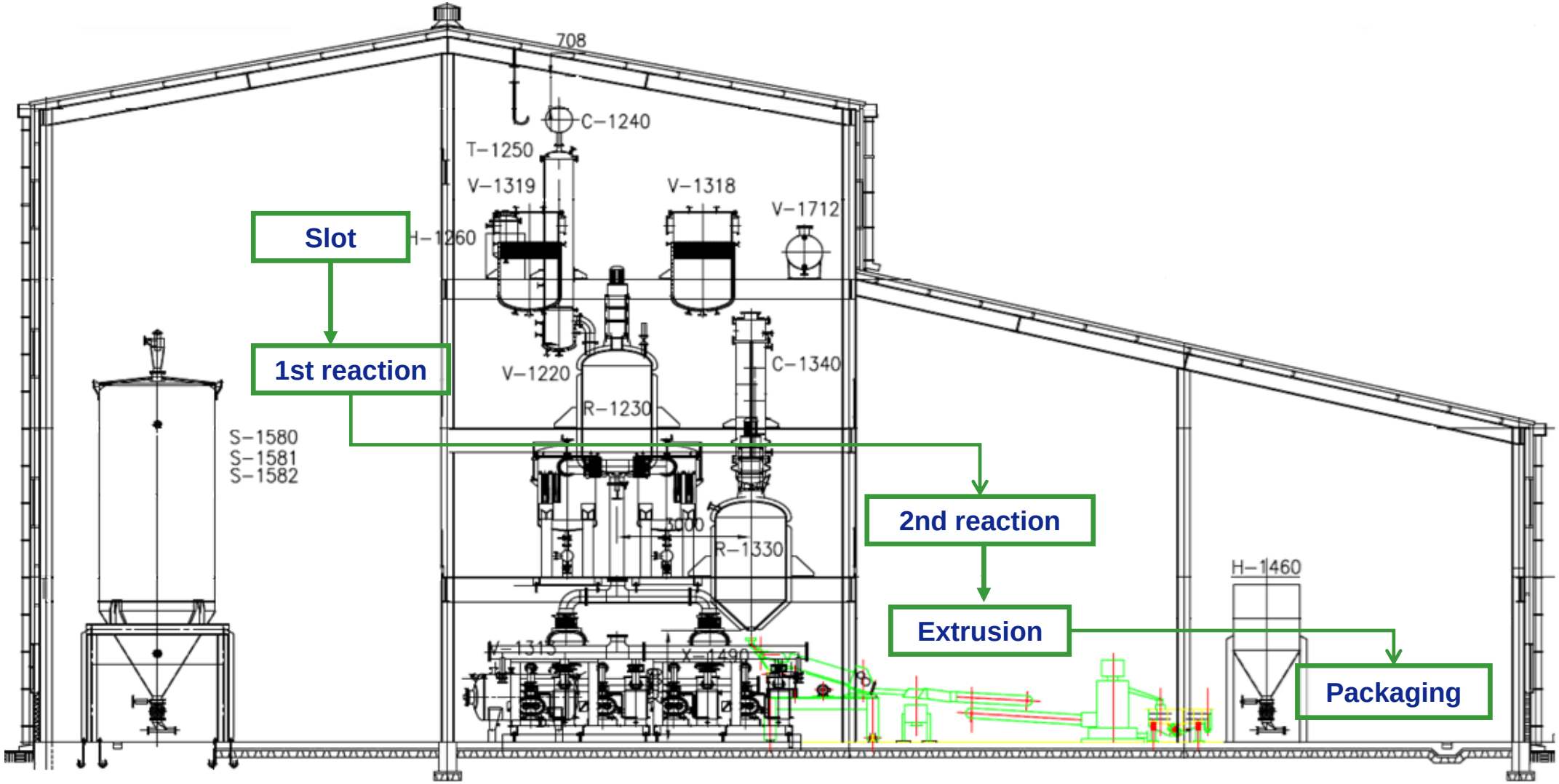
PATENT			
NO.	**Nation**	**Patent No.**	**Patent Name**
1	Germany	DE 112013005926	A process for the continuous production of biodegradable aliphatic / aromatic polyester copolymer
2	Germany	DE 112013005929	A process for the continuous production of biodegradable aliphatic / aromatic polyester copolymer
3	Germany	DE 112013005940	A process for the continuous production of biodegradable aliphatic / aromatic polyester copolymer
4	The United States	US 6,399,716	Copolyester resin composition and a process of preparation thereof
5	The United States	US 6,713,595	Copolyester resin composition and a process of preparation thereof
6	The United States	US 9,334,359(KR10-2012-0097878)	Method for continuously preparing biodegradable aliphatic/aromatic polyester copolymer
7	The United States	US 9,403,938(KR10-2012-0144803)	Method for continuous production of biodegradable aliphatic/aromatic polyester copolymer
8	The United States	US 9,416,224(KR10-2012-0144804)	Method for continuous production of biodegradable aliphatic/aromatic polyester copolymer
9	The United States	US 9,447,233(KR10-2012-0144805)	Method for continuous production of biodegradable aliphatic/aromatic polyester copolymer
10	The United States	US 9,637,589(KR10-2012-0097877)	Method for continuously preparing biodegradable aliphatic/aromatic polyester copolymer
11	Europe	EP 2671899	Biodegradable resin and method for manufacturing same
12	Japan	JP 6016923	Method for producing biodegradable polyester copolymer resin
13	Japan	JP 6078152(KR10-2012-0083244)	Foaming resin composition containing biodegradable resin and foam produced therefrom
14	Republic of Korea	KR 10-0428687	Biodegradable polyester resin composition which has superior tear strength

RESEARCH & DEVELOPMENT *(cont.)*

PATENT			
NO.	**Nation**	**Patent No.**	**Patent Name**
15	Republic of Korea	KR 10-1163924	Biodegradable resin and preparation method for the same
16	Republic of Korea	KR 2002-0039514	Biodegradable aliphatic polyester resin composition and preparation thereof
17	Republic of Korea	KR 2012-0097877	Method for continuous production of biodegradable aliphatic/aromatic polyester copolymer
18	Republic of Korea	KR 2012-0144805	Method for continuous production of biodegradable aliphatic/aromatic polyester copolymer
19	Republic of Korea	KR 2019-0039053	Method for continuous production of biodegradable aliphatic polyester
20	Republic of Korea	KR 10-1237953	Method of manufacturing inorganic resin without VOCs
21	Republic of Korea	KR 10-1493195	Polycyclohexyldimethylene terephthalate resin compositions with excellent mechanical property and transparence
22	Republic of Korea	KR 10-1644754	Manufacturing method of biodegradable composite fertilizer filament for 3D print and the biodegradable composite fertilizer filament manufactured thereby
23	Republic of Korea	KR 10-1831854	Copolyester resin composition having excellent hydrolysis resistant and biodegradable
24	Republic of Korea	KR 10-1850515	Biodegradable filament composition for 3D printer containing metal powder and filament for 3D printer using the same
25	Republic of Korea	KR 10-1860388	ABS composition for 3D printer filament having excellent discoloration resistance and low shrinkage and filament manufactured therefrom
26	Republic of Korea	KR 10-1989045	Biodegradable resin composition having excellent weather resistance and storage stability and the method of manufacturing the same

CORE TECHNOLOGY

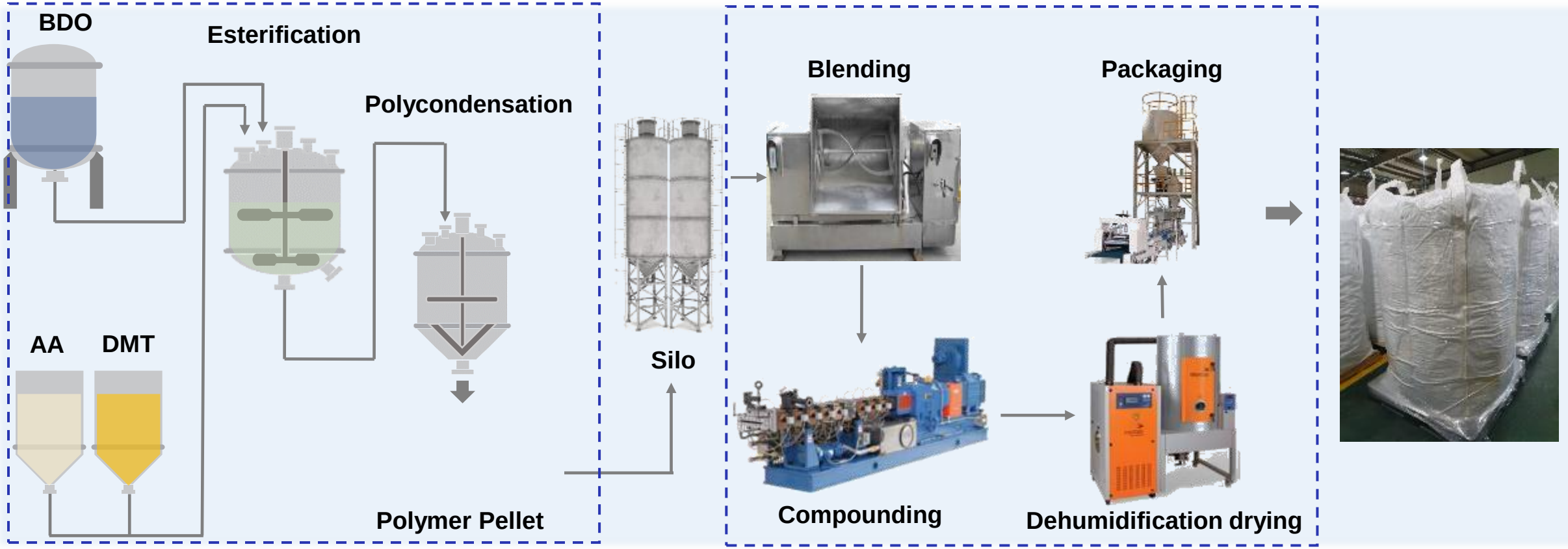
SYNTHESIS TECHNOLOGY



CORE TECHNOLOGY *(cont.)*

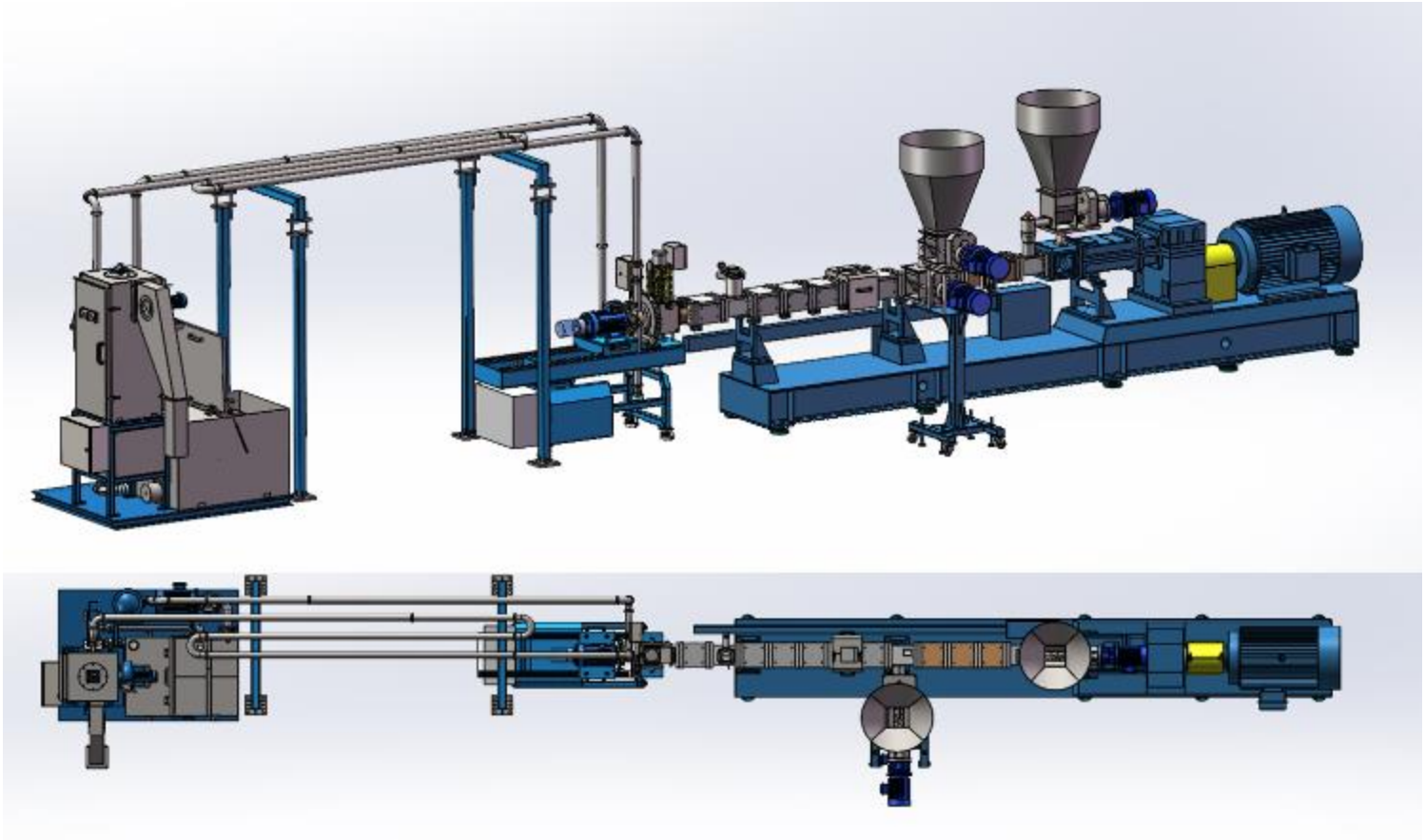
SYNTHESIS TECHNOLOGY

Process of PBAT



CORE TECHNOLOGY *(cont.)*

COMPOUNDING TECHNOLOGY



CORE TECHNOLOGY *(cont.)*

COMPOUNDING TECHNOLOGY

Input
(Weighing)

Mixing
(PBAT & Chemical agent)

Compounding with chain extender
(Temp., Speed, color)

Cooling
(water temp.)

Packaging

Weighing

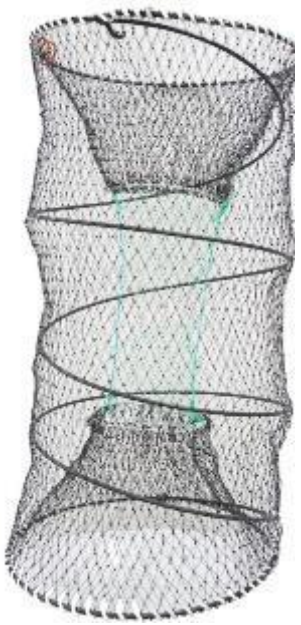
Solid state polymerization
(Temp. & Time)

Pelletizer
(Chip size)

RESEARCH & DEVELOPMENT *(cont.)*

PRODUCT CUSTOMAZATION

- ✓ Our experienced experts are always ready to research to develop a wide variety of products in the shortest time, meeting the needs of customers around the world.
- ✓ Some fully biodegradable products that we have successfully developed including bio-fishing nets, mulch films, food tray, baby products, etc.



OUR PRODUCTION CAPACITY

Factory in Korea

Production capacity
6,000 ton/year

Products
PBAT, PBS resin
Compound resin

Factory in Vietnam

Production capacity
10,000 ton/year

Products
Compound resin

PBAT factory project in Vietnam

Installed Capacity
20,000 -30,000 tons/year

Address
Dinh Vu IP - Hai Phong

Expected launch in
2024

INTERNATIONAL CERTIFICATES

SGS

** According to EU and FDA standards*

REACH COMPLIANT

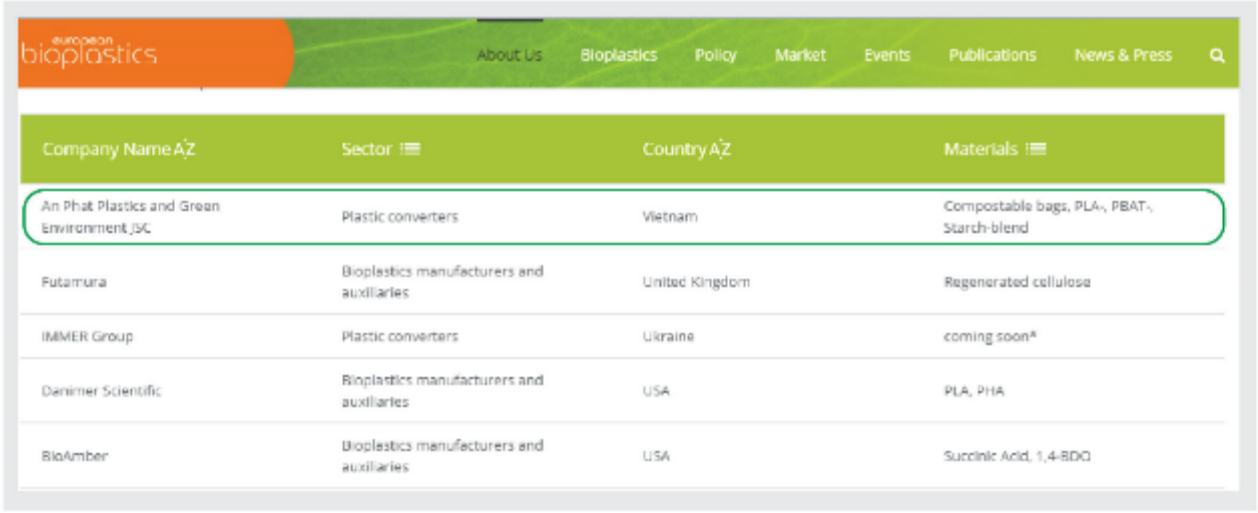
Korea Eco-Label

BIOBASED 50 - 85 %

DIN Geprüft

BPI ®

INTERNATIONAL CERTIFICATES *(cont.)*



Company Name A-Z	Sector	Country A-Z	Materials
An Phat Plastics and Green Environment JSC	Plastic converters	Vietnam	Compostable bags, PLA-, PBAT-, Starch-blend
Futamura	Bioplastics manufacturers and auxiliaries	United Kingdom	Regenerated cellulose
IMMER Group	Plastic converters	Ukraine	coming soon*
Danimer Scientific	Bioplastics manufacturers and auxiliaries	USA	PLA, PHA
BioAmber	Bioplastics manufacturers and auxiliaries	USA	Succinic Acid, 1,4-BDO

1 of the 5 Asian members of the European Bioplastics Association

ANBIO
BIODEGRADABLE
MATERIALS

PBAT Resins | PBS Resins | Bio-Compound

BIODEGRADABLE MATERIALS

PBAT RESIN	PBS RESIN	BIO-COMPOUND
BG1000	BG5000J	BG4400
	BG5000M	BG4800
		BG8800
		Anbio S3
		Anbio CTR02

PBAT RESINS

BG1000

FEATURES

- Suitable for food contact
- Tear resistance
- Tensile strength
- Low acid value

APPLICATIONS

• Blow film, compounding

SHELF LIFE

12 months from date of production

PBAT RESINS

BG1000

FINISHED PRODUCTS:

Thin film, PLA reforming, bags, paper cup coating

PBS RESINS

BG5000J

FEATURES

- High MI

APPLICATIONS

- Coating, injection molding

SHELF LIFE

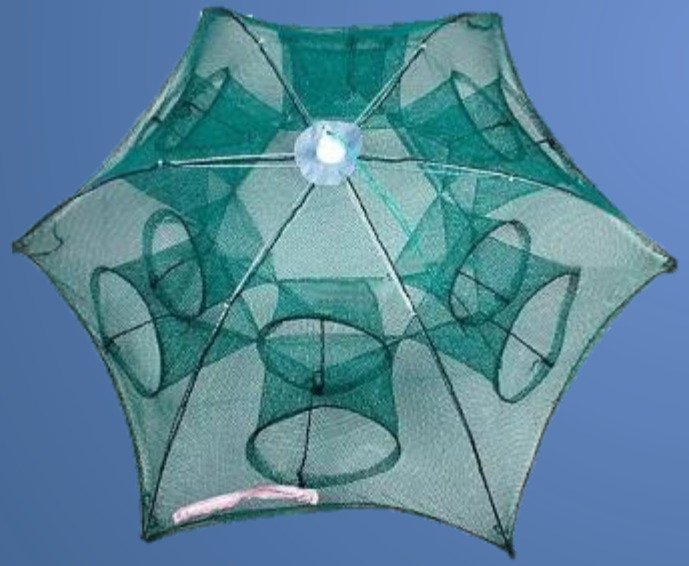
- 12 months from date of production

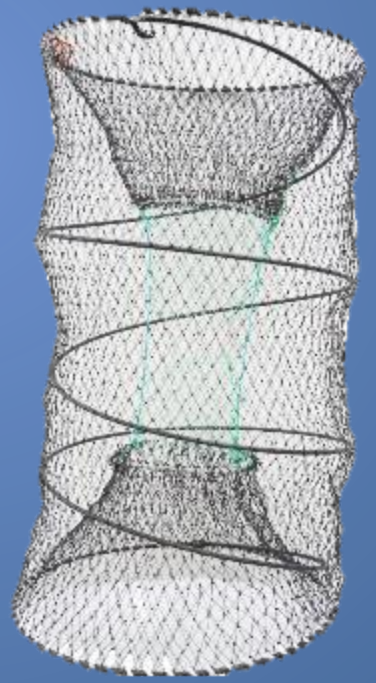
PBS RESINS

BG5000J

FINISHED PRODUCTS

Fishing gear, cell phone case, diverse disposable products





PBS RESINS

BG5000M

FEATURES

- Low MI

APPLICATIONS

- Mainly used for extrusion

SHELF LIFE

- 12 months from date of production

PBS RESINS

BG5000M

FINISHED PRODUCTS

Sheet, film, fiber (fishing net)

BIO-COMPOUND

BG4400

INGREDIENTS:
Polylactic acid (PLA), talc, additives

FEATURES

- Stable production ability
- High MI
- High temperature resistance: 80-90℃

APPLICATIONS

- Injection molding & thermoforming

SHELF LIFE

- 12 months from date of production

BIO-COMPOUND

BG4400

FINISHED PRODUCTS

Food container, cutlery, meal kits

BIO-COMPOUND

BG4800

INGREDIENTS:

Polylactic acid (PLA), impact modifier

FEATURES

- Strong impact resistance

APPLICATIONS

- Apply for extrusion processing.

SHELF LIFE

- 12 months from date of production

BIO-COMPOUND

BG4800

FINISHED PRODUCTS

3D printing filament

BIO-COMPOUND

ANBIO S3

INGREDIENTS:
PBAT, PLA, additives

FEATURES

- High bio-based percentage

APPLICATIONS

- Mainly used for extrusion
- Finished products: straight and bendy straws

SHELF LIFE

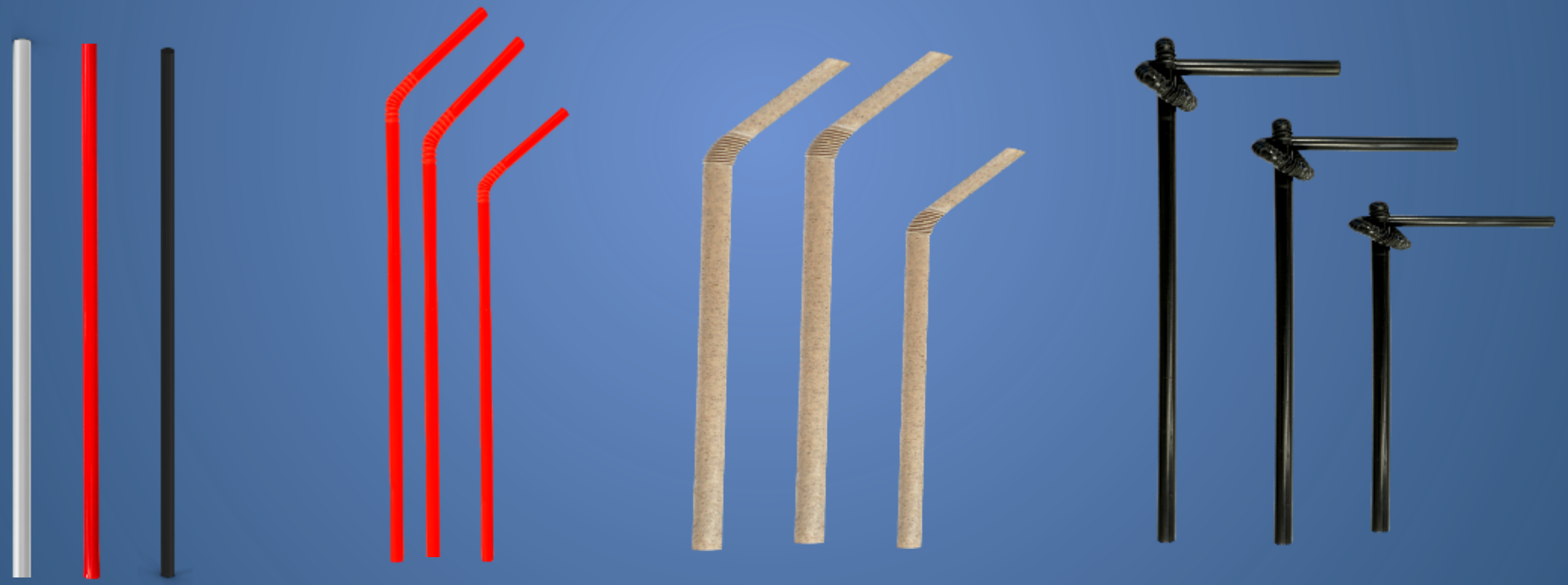
- 12 months from date of production

BIO-COMPOUND

ANBIO S3

FINISHED PRODUCTS

Straight and bendy straws



BIO-COMPOUND

ANBIO CTR02

INGREDIENTS:
PBAT, PLA, CaCO3, Additives

FEATURES

- Transparent/Translucent
- Low Melting Index (MI)

APPLICATIONS

- Blowing film

SHELF LIFE

- 12 months from date of production

BIO-COMPOUND

ANBIO CTR02

FINISHED PRODUCTS

Shopping bags, gloves

BIO-COMPOUND

BG8800

INGREDIENTS:

PBAT, PLA, filler, additives

FEATURES

- Stronger and more flexible
- Stable production ability
- Low melting index (MI)
- Low acid value

APPLICATIONS

- Blow-molding

SHELF LIFE

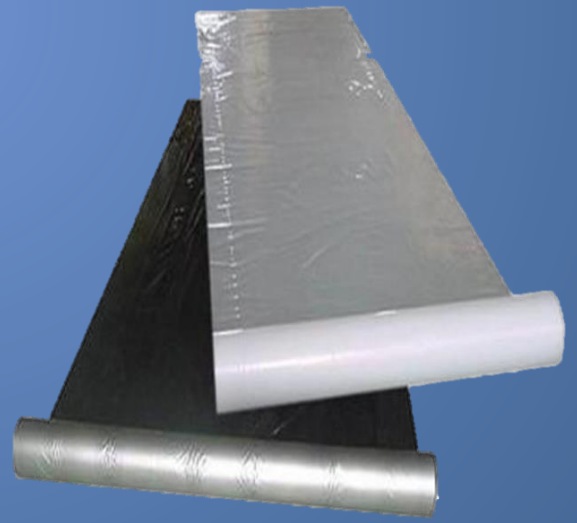
- 12 months from date of production

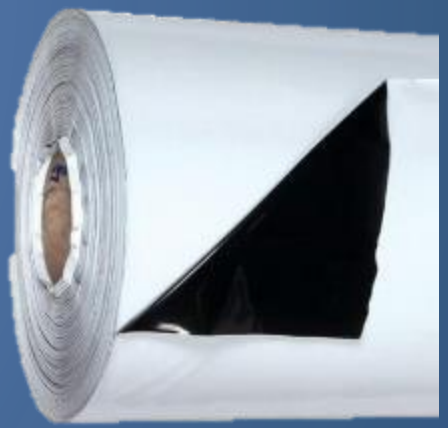
BIO-COMPOUND

BG8800

FINISHED PRODUCTS

Shopping bag, mulch film, single-use glove, etc.





WHY CHOOSE US?

Long experience

First factory specialized in bioplastics since 1990

Modern machinery

imported from German, Korea, Japan

Full biodegradability tester

1 out of 6 organizations in ASIA to have

Material customization

according to client's requirements

High quality

equivalent with EU products

$ Competitive price

Thank you

for joining us in protecting the planet