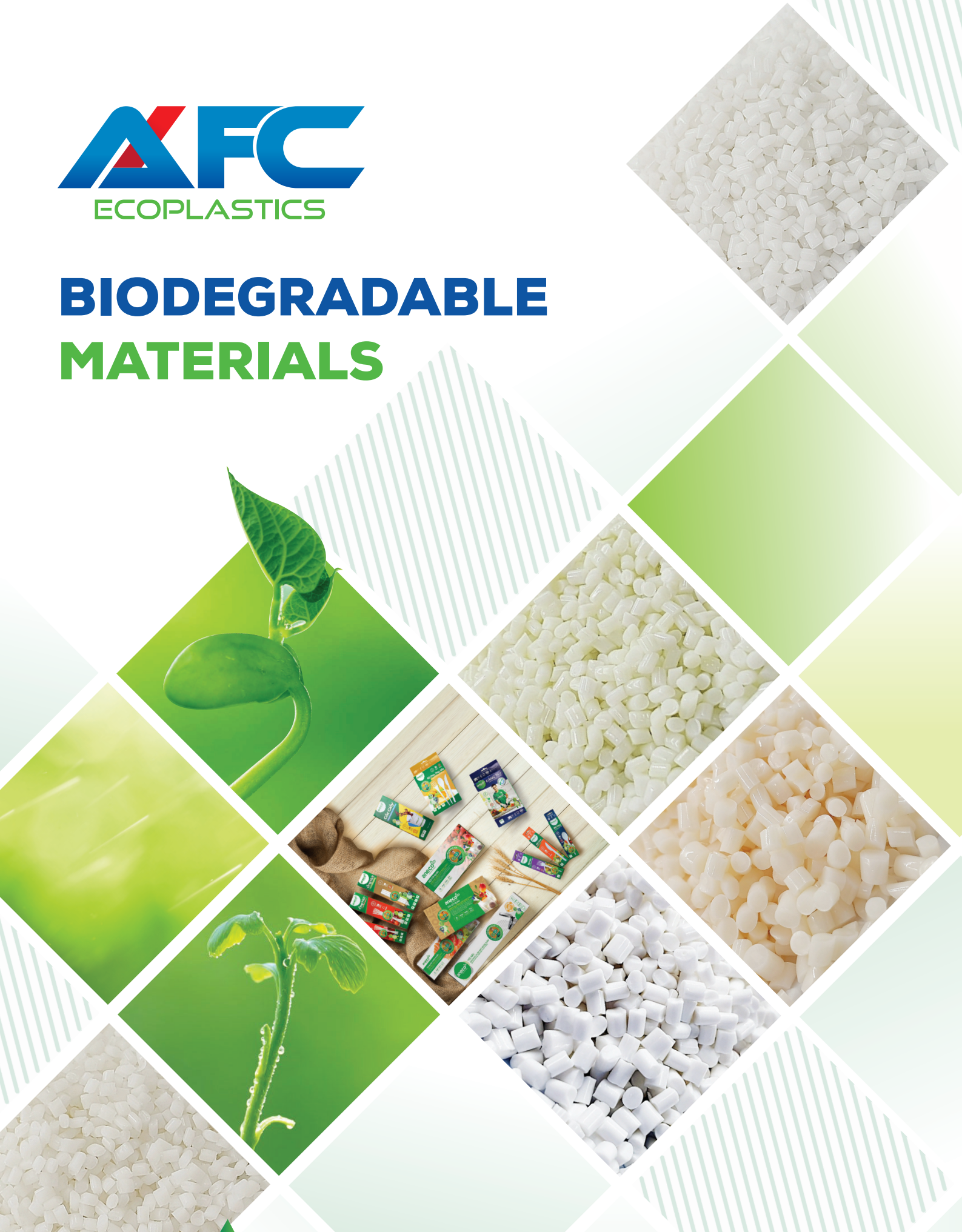
AFC
ECOPLASTICS

BIODEGRADABLE MATERIALS



AFC INTRODUCTION

AFC is a Texas-based joint venture subsidiary of An Phat Holdings (Vietnam) that focuses on the sale and distribution of bio-products and bio-resins for the North and South American markets. An Phat Holdings is a publicly traded (HOSE: APH), multinational corporation headquartered in Vietnam. An Phat's factories in Vietnam and South Korea allow it to distribute products to over 60 countries around the world and to leading global companies like Samsung, LG, and Honda.

WORLDWIDE MARKET

BIO-RESIN

BG1000

- 100% PBAT
- High molecular weight substance
- Highly compatible with natural materials like PLA, PBS, TPS, Starch...
- Good processability, weldable and printable
- **Shelf life:** 12 months
- **Applications:** can be processed on conventional blow-molding machines, blending process

PHYSICAL/ MECHANICAL PROPERTIES

ITEM	CONDITIONS	METHOD	UNIT	VALUE
Density	25°C	ASTM D792	g/ml	1.25
MFI	190°C/2.16kg	ASTM 1238	g/10min	2-5
Melt Temperature	-	ASTM 3418	°C	125
Tensile Strength (MD/TD)	25°C	ASTM D638	kgf/cm^2	> 400/500
Elongation (MD/TD)	25°C	ASTM D638	%	> 500/600
Tear Strength (MD)	25°C	ASTM D1004	kgf/cm	400/1600

* Thickness 30µm

BG1070

- 100% PBAT
- High molecular weight, low acid value
- Good processability, weldable and printable
- Highly compatible with natural materials like PLA, PBS, TPS, Starch...
- **Shelf life:** 12 months
- **Applications:** can be processed on conventional blow-molding machines, blending process, preferable for injection moulding process

PHYSICAL/ MECHANICAL PROPERTIES

ITEM	CONDITIONS	METHOD	UNIT	VALUE
Density	-	ASTM D792	g/ml	1.20 ~ 1.23
MFI	190°C/2.16kg	ASTM D1238	g/10min	15.0 ~ 25.0
Melt Temperature	-	ASTM 3418	°C	120 ~ 130
Tensile Strength (MD/TD)	-	ASTM D638	kgf/cm^2	350/ 450
Elongation (MD/TD)	-	ASTM D638	%	500/ 600
Tear Strength (MD)	-	ASTM D1004	kgf/cm	100

* Thickness 30µm

BG5000J

· 100% PBS
· Certified Compostable and Biodegradable
· Suitable for food contact
· High MI
· **Shelf life:** 12 months
· **Applications:** Can be processed for coating, injection molding (fishing gear), production of diverse disposable products

PHYSICAL/ MECHANICAL PROPERTIES				
ITEM	**CONDITIONS**	**METHOD**	**UNIT**	**VALUE**
Density	-	ASTM D792	-	1.3
MFI	190°C/2.16kg	ASTM D1238	g/10min	15~25
Melt Temperature	-	ASTM 3418	°C	115~118
Tensile Strength	-	ASTM D638	Mpa	>370
Elongation	-	ASTM D638	%	>10
HDT	-	JIS K7207	°C	92

BG5000M

· 100% PBS
· Certified Compostable and Biodegradable
· Low MI
· **Shelf life:** 12 months
· **Applications:** Can be mainly used for extrusion to produce sheet, film, fiber (fishing net)

PHYSICAL/ MECHANICAL PROPERTIES				
ITEM	**CONDITIONS**	**METHOD**	**UNIT**	**VALUE**
Density	-	ASTM D792	-	1.25~1.27
MFI	190°C/2.16kg	ASTM D1238	g/10min	2~5
Melt Temperature	-	ASTM 3418	°C	115~118
Tensile Strength	-	ASTM D638	kgf/cm^2	>370
Elongation	-	ASTM D638	%	>100
HDT	-	JIS K7207	°C	93

BIO-COMPOUND

CTR02

· CTR02 is a biodegradable and compostable compound based on a blend of Polylactic acid (PLA), and PBAT. CTR02 is designed for blown film processing. With low MI, CTR02 can produce very thin film (minimum 13 microns)

· **Application:** Compostable shopping bags, bags on roll, film, etc.

PHYSICAL/ MECHANICAL PROPERTIES

ITEM	CONDITIONS	METHOD	UNIT	VALUE
Density	-	ASTM D-792	g/cm^3	1.4+-0.02
Melting Point	-	DSC	^{0}C	110-125
Melt Flow Rate	190^{0}C/2.16kg		g/10min	2-6
Moiture content	80^{0}C, 15min	-	%	<0.1
Appearance	25^{0}C	-	-	nature
Tensile strength MD/TD	25^{0}C	ISO527-3	MPa	29/18
Elongation at Break MD/TD	25^{0}C	ISO527-3	%	200/500
Tear Strength MD/TD	25^{0}C	ISO 6383-2	nM	1800/800
Dart Drop	25^{0}C	ISO 7765-1	g	230

* Thickness 20µm

CTR02-E

· Made from PBAT and CaCO3
· Good processability, printable
· **Applications:** White film (Shopping bags, grocery bags, carry bags, etc)
· **Shelf life:** 12 months

PHYSICAL/ MECHANICAL PROPERTIES

ITEM	CONDITIONS	METHOD	UNIT	VALUE
Density	-	ASTM D-792	g/cm3	1.45+-0.02
Melting Point	-	DSC	^{0}C	115-125
Melt Flow Rate	190^{0}C/2.16kg	ASTM 1238	g/10min	2-6
Moiture content	80^{0}C, 15min	-	%	<0.2
Appearance	25^{0}C	-	-	White
Tensile strength MD/TD	25^{0}C	ISO527-3	Mpa	16/10
Elongation at Break MD/TD	25^{0}C	ISO527-3	%	250/500
Tear Strength MD/TD	25^{0}C	ISO 6383-2	mN	450/1800
Dart Drop	25^{0}C	ISO 7765-1	g	120

*Thickness 20µm

CTR02-M

CTR02-M is a biodegradable and compostable compound based on a blend of PLA and PBAT. It is designed for blown film processing. CTR02-M can be processed on conventional blown film equipment. With low MI, CTR02-M can produce very thin film (minimum: 13 microns)

· **Applications:** Compostable mulch film

· **Shelf life:** 12 months

PHYSICAL/ MECHANICAL PROPERTIES				
ITEM	**CONDITIONS**	**METHOD**	**UNIT**	**VALUE**
Density	-	ASTM D-792	g/cm³	1.4+-0.02
Melting Point	-	DSC	ºC	125-130
Melt Flow Rate	190ºC/2.16kg	ASTM 1238	g/10min	2-5
Moiture content	80ºC, 15min	-	%	<0.1
Apprearance	25ºC	-	-	Nature
Tensile strength MD/TD	25ºC	ISO527-3	Mpa	28/17
Elongation at Break MD/TD	25ºC	ISO527-3	Mpa	200/500
Tear Strength MD/TD	25ºC	ISO 6383-2	Nm	1700/800
Dart Drop	25ºC	ISO 7765-1	g	230

*Thickness 20µm

CTR04

· Made from PLA + PBAT and Starch kinds of Biodegradable resin

· Compound for Rollbag, Compost bag, Carrier bag, etc

· **Achieved certificate:** TÜV OK compost HOME

· **Applications:** White film (Shopping bags, grocery bags, carry bags, etc)

· **Shelf life:** 12 months

PHYSICAL/ MECHANICAL PROPERTIES				
ITEM	**CONDITIONS**	**METHOD**	**UNIT**	**VALUE**
Density	-	ASTM D-792	g/cm³	1.3+-0.02
Melting Point	-	DSC	˚C	118-125
Melt Flow Rate	190ºC/2.16kg	ASTM 1238	g/10min	3-6
Moiture content	80ºC, 15min	-	%	<0.1
Apprearance	25ºC	-	-	Light yellow
Tensile strength MD/TD	25ºC	ISO527-3	Mpa	18/11
Elongation at Break MD/TD	25ºC	ISO527-3	%	300/600
Tear Strength MD/TD	25ºC	ISO 6383-2	mN	350/1800
Dart Drop	25ºC	ISO 7765-1	g	170

*Thickness 15µm

BG4400

· Compound made from PLA and additives
· Certified Compostable and Biodegradable
· High biobased content
· Suitable for food contact
· Optimal balance of stiffness and toughness
· Easy processing
· **High temperature resistance:** 100-115°C
· **Shelf life:** 12 months
· **Applications:** Can be used in producing food container, cutlery, usable on conventional plastics injection molding machines.

PHYSICAL/ MECHANICAL PROPERTIES

ITEM	CONDITIONS	METHOD	UNIT	VALUE
Density	-	ASTM D792	g/ml	1.4
MFI	190°C/2.16kg	ASTM D1238	g/10min	5~12
HDT	-	ASTM D648	°C	100~120
Tensile Yield Strength	-	ASTM D638	kgf/cm²	300~400
Tensile Elongation	-	ASTM D638	%	<20

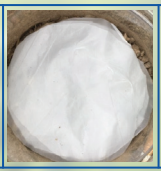
CERTIFICATIONS & COMPOSTABILITY TEST

CERTIFICATIONS

HOME OK compost · TÜV AUSTRIA HOME S0584 · BPI COMPOSTABLE · BIOBASED 50 - 85% DIN Geprüft · Korea Eco-Label · REACH COMPLIANT · SGS · Health Canada · Santé Canada

** According to EU and FDA standards*

COMPOSTABILITY TEST

MATERIALS	0 week	2 weeks	1 month	3 months	6 months	12 months
Compostable						
Polyethylene						

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