



# 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





### BG1000

- 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



#### 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 <sup>2</sup>	> 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



#### 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 <sup>2</sup>	> 220/ 180
Elongation (MD/TD)	25°C	ASTM D638	%	> 300/450
Tear Strength (MD)	25°C	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 <sup>2</sup>	>370
Elongation	-	ASTM D638	%	>100
HDT	-	JIS K7207	°C	93

## BG8800

- Compound made from PBAT, PLA with slip and anti-block agent
- Certified Compostable and Biodegradable
- High tensile strength and excellent failure energy
- Easy processing
- Low melting index (MI)
- Low acid value
- **Shelf life:** 12 months
- **Applications:** can be used in producing general thin film.



## PHYSICAL/ MECHANICAL PROPERTIES

ITEM	CONDITIONS	METHOD	UNIT	VALUE
Density	-	ASTM D792	-	1.29~1.32
MFI	190°C/2.16kg	ASTM D1238	g/10min	2~5
Melt Temperature	-	ASTM 3418	°C	110~130, 150~180
Tensile Strength (MD/TD)	-	ASTM D638	kgf/cm <sup>2</sup>	>320
Elongation (MD/TD)	-	ASTM D638	%	>450
Tear Strength (MD)	-	ASTM D1004	kgf/cm	>110

\* Thickness 20μm

### CTR02-A

- Made from PLA and PBAT
- Good processability, printable
- **Applications:** transparent film (Shopping bags, grocery bags, carry bags, etc)
- **Shelf life:** 12 months



## PHYSICAL/ MECHANICAL PROPERTIES

ITEM	CONDITIONS	METHOD	UNIT	VALUE
Density	25°C	ISO 1183	g/cm <sup>3</sup>	1.25-1.27
MFI	190°C/2.16kg	ASTM 1238	g/10min	2-4
Melt temperature	-	DSC	°C	128-130
Tensile strength (MD/TD)	25°C	ISO527-3	Mpa	30/13
Elongation (MD/TD)	25°C	ISO527-3	Mpa	200/450
Tear Strength (MD/TD)	25°C	ISO 6383-2	mN	100/600

\*Thickness 14μm

### CTR02-B

- Made from PLA and PBAT
- Good processability, printable
- **Applications:** translucent film (Shopping bags, grocery bags, carry bags, etc)
- **Shelf life:** 12 months



## PHYSICAL/ MECHANICAL PROPERTIES

ITEM	CONDITIONS	METHOD	UNIT	VALUE
Density	25°C	ISO 1183	g/cm <sup>3</sup>	1.25-1.27
MFI	190°C/2.16kg	ASTM 1238	g/10min	5-10
Melt temperature	-	DSC	°C	125-130
Tensile strength (MD/TD)	25°C	ISO527-3	Mpa	30/14
Elongation (MD/TD)	25°C	ISO527-3	Mpa	200/500
Tear Strength (MD/TD)	25°C	ISO 6383-2	mN	300/1800

\*Thickness 11μm

## CTR02-C

- Made from PBAT, PLA and CaCO<sub>3</sub>
- 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	25°C	ISO 1183	g/cm <sup>3</sup>	1.33
MFI	190°C/2.16kg	ASTM 1238	g/10min	2-5
Melt temperature	-	DSC	°C	128-132
Tensile strength (MD/TD)	25°C	ISO527-3	Mpa	28/24
Elongation (MD/TD)	25°C	ISO527-3	Mpa	400/500
Tear Strength (MD/TD)	25°C	ISO 6383-2	mN	600/1500

\*Thickness 25µm

## CTR02-D

- Made from PBAT and Starch
- 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	25°C	ISO 1183	g/cm <sup>3</sup>	1.23-1.25
MFI	190°C/2.16kg	ASTM 1238	g/10min	3-5
Melt temperature	-	DSC	°C	120-125
Tensile strength (MD/TD)	25°C	ISO527-3	Mpa	18/9
Elongation (MD/TD)	25°C	ISO527-3	Mpa	300/600
Tear Strength (MD/TD)	25°C	ISO 6383-2	mN	350/1800

\*Thickness 14µm

## CTR02-E

- Made from PBAT and CaCO<sub>3</sub>
- 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	25°C	ISO 1183	g/cm <sup>3</sup>	1.45-1.47
MFI	190°C/2.16kg	ASTM 1238	g/10min	2-3
Melt temperature	-	DSC	°C	125-130
Tensile strength (MD/TD)	25°C	ISO527-3	Mpa	14/8
Elongation (MD/TD)	25°C	ISO527-3	Mpa	250/500
Tear Strength (MD/TD)	25°C	ISO 6383-2	mN	400/1600

\*Thickness 14µm

## ANBIO S3

- Made from PLA and PBAT
- Mainly used for extrusion.
- **Applications:** straight and bendy straws
- **Shelf life:** 12 months



### PHYSICAL/ MECHANICAL PROPERTIES

ITEM	CONDITIONS	METHOD	UNIT	VALUE
Density	25°C	ISO 1183	g/cm <sup>3</sup>	1.263
MFI	190°C/2.16kg	ASTM 1238	g/10min	2-5
Melt temperature	-	DSC	°C	155
Apperance	25°C	-	-	White

## 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/cm <sup>2</sup>	300~400
Tensile Elongation	-	ASTM D638	%	<20

## BG4800

- Made from polylactic acid resin (PLA), impact modifier
- Certified Compostable and Biodegradable
- Strong impact resistance
- **Shelf life:** 12 months
- **Applications:** Can be used in producing 3D filaments.



### PHYSICAL/ MECHANICAL PROPERTIES

ITEM	CONDITIONS	METHOD	UNIT	VALUE
Density	-	ASTM D792	-	1.15-1.2
MFI	190°C/2.16kg	ASTM D1238	g/10min	5-10
HDT	-	ASTM D648	°C	50
Tensile Yield Strength	-	ASTM D638	Mpa	>38
Tensile Elongation	-	ASTM D638	%	>5
Notched Izod impact	Notched	ASTM D256	J/m	>200
Flexural Strength	-	ASTM D790	Mpa	>40





# CERTIFICATIONS & COMPOSTABILITY TEST

## CERTIFICATIONS



\* 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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