長春集團
Chang Chun Group

Enhancing Lives
Through
INNOVATIVE CHEMISTRY

CCP Bioplastic compound

~ The Most Reliable polyester supplier from Taiwan

Company Introduction

Facts about CCP 長春集團 Chang Chun Group

1949 **Founded in Taiwan**

Three founders : M. K. Liao, Su Hon Lin, S. Y. Tseng

No.2 **In Taiwan**

Second Largest Chemical Company

34 **Companies**

Within the Group

12,000+ **Employees**

Globally as of 2019

$ 9.5 bn **Sales**

Annualy as of 2019

Chan Chun Plastics
長春人造樹脂廠股份有限公司

Coating Resins
Functional Polymers
Engineering Plastics
Commodity Chemical

Chang Chun Petrochemical
長春石油化學股份有限公司

Ethylene Downstream
Electronic Chemical
Specialty Chemical
High Purity Chemical

Dairen Chemical
大連化學工業股份有限公司

Technical Oriented Chemical
Chemical Commodity

Product Portfolio

Plastic Industry
- **Engineering Plastics**
- Antioxidant
- Flame Retardants
- Plasticizers
- Glass Fiber

Chemical Industry
- VAM
- **1,4 - BDO**
- Phenol
- Acetic Acid
- Formaldehyde
- MP-Diol
- Solvents

Semiconductor Industry
- PVA Film
- Epoxy Molding Compound
- Photo-Resist
- Stripper
- High Purity Chemicals

CCP

Enhancing Lives Through

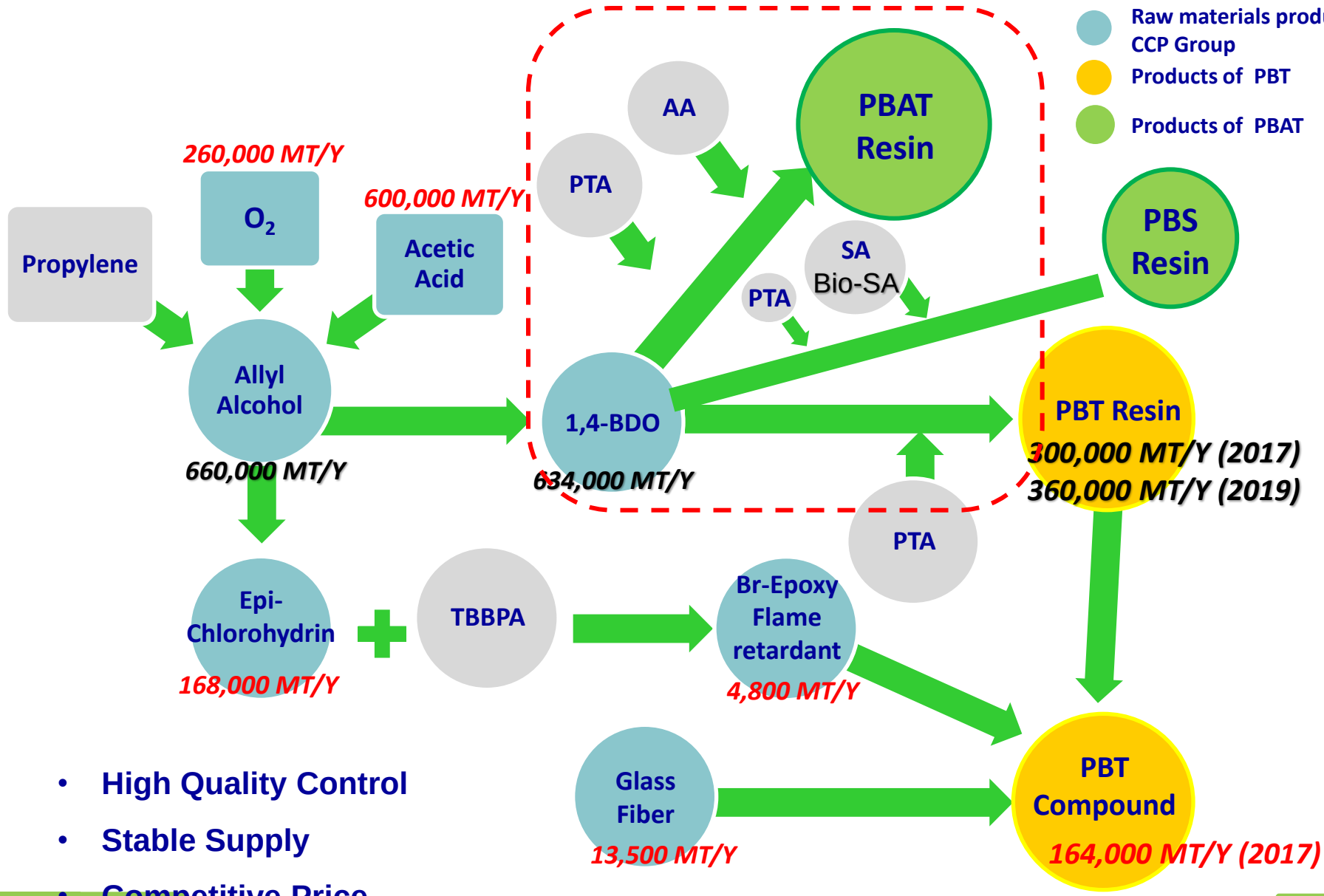
INNOVATIVE CHEMISTRY

Automotive Industry
- PBT Compound
- PVB Film for Windshield
- EVOH for Gas Tanks

Electronic Industry
- **PBT Compound**
- Copper Foil
- Photo-Resist
- Stripper
- Thinner

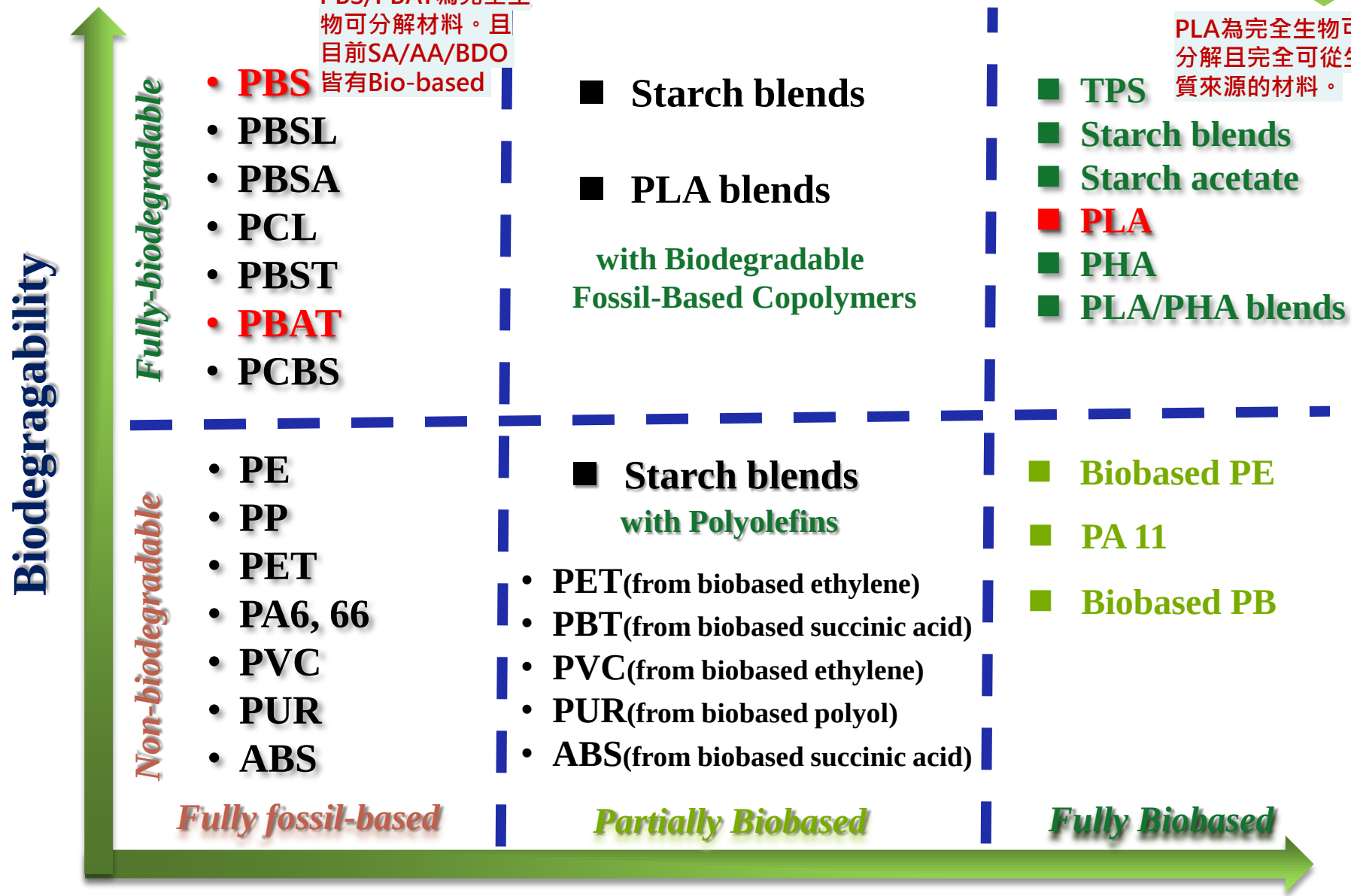
Coating & Paint Industry
- Epoxy Resins
- Melamine Resines
- Polyester Resins
- VAE Emulsion

CCP PBT / PBAT Vertical Integration

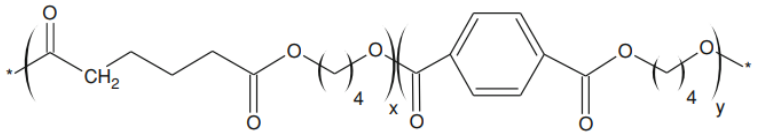


- High Quality Control
- Stable Supply
- Competitive Price

生質塑膠介紹



PBAT Introduction



- Poly (butyleneadipate-co-terephthalate),PBAT, is a aliphatic-aromatic copolyester based on the monomers 1,4-butanediol, adipic acid and terephthalic acid.

  PBAT 為脂肪族-芳香族共聚酯。

- Be easily molded and thermoformed.

  易於成形。

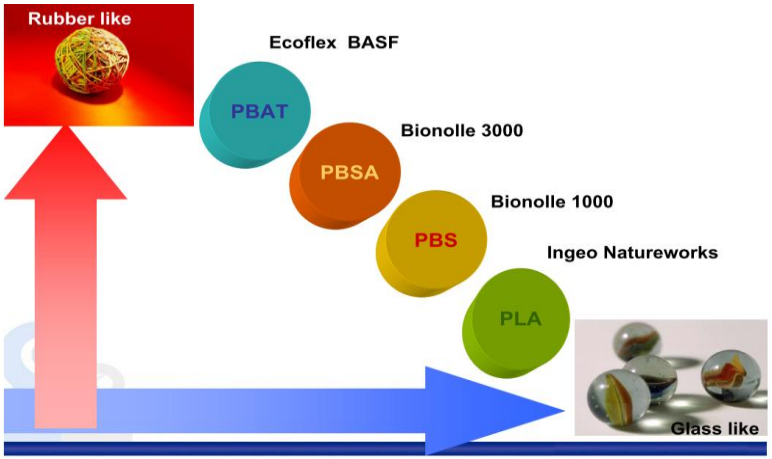
- One of the few compostable polymers.

  可堆肥分解之聚合物。

	PBS	PBSA	PBAT	PLA	HDPE	LDPE	PS	PP
Density (g/cm3)	1.26	1.24	1.22	1.24	0.94~0.98	0.91~0.94	1.04	0.97
Glass Transition Temperature (Celsius)	-32	-45	-25	55	-120	-120- -40	105	-5
Melting Point (Celsius)	115	96	120	140-180	129	110	Amorphous	163
Heat Distortion Temperature (HDT-B, Celsius)	95	69	45	55	82	49	95	110
Tensile Strength (MPa)	36	19	15-25	66	28	10	46-60	33
Elongation at break (J/m, %)	170-210	380	400	4	700	300	3-4	415
Degree of Crystallinity (%)	34-45	20-30	25-35	0-40	69	49	0	56

Bio-degradable polymer Comparison

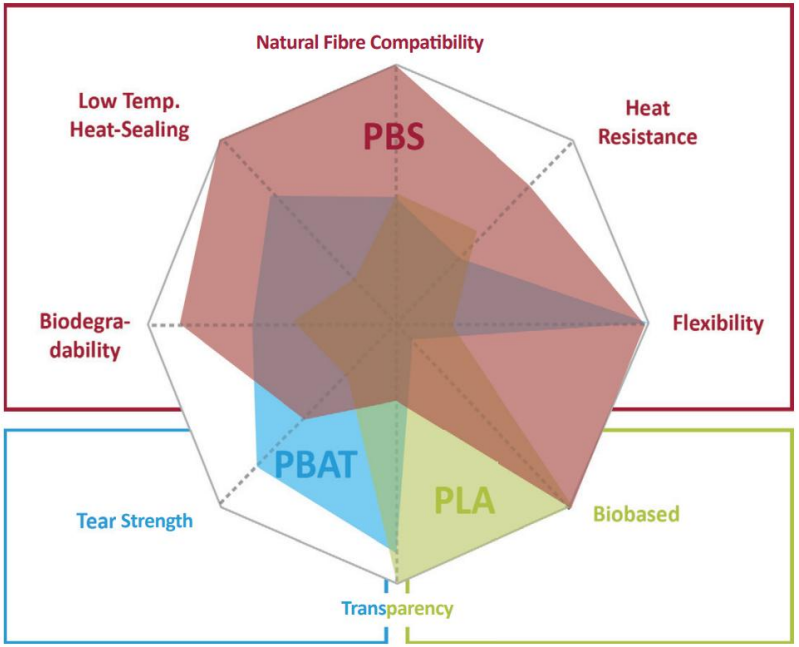
- ◆Biodegradability: PBSA>PBS>PBAT>PLA
- ◆Heat Resistance: PBS>PBSA>PLA>PBAT
- ◆Tear Strength: PBAT>PBSA>PBS>PLA
- ◆Flexibility: PBAT>PBSA>PBS>PLA



PBAT

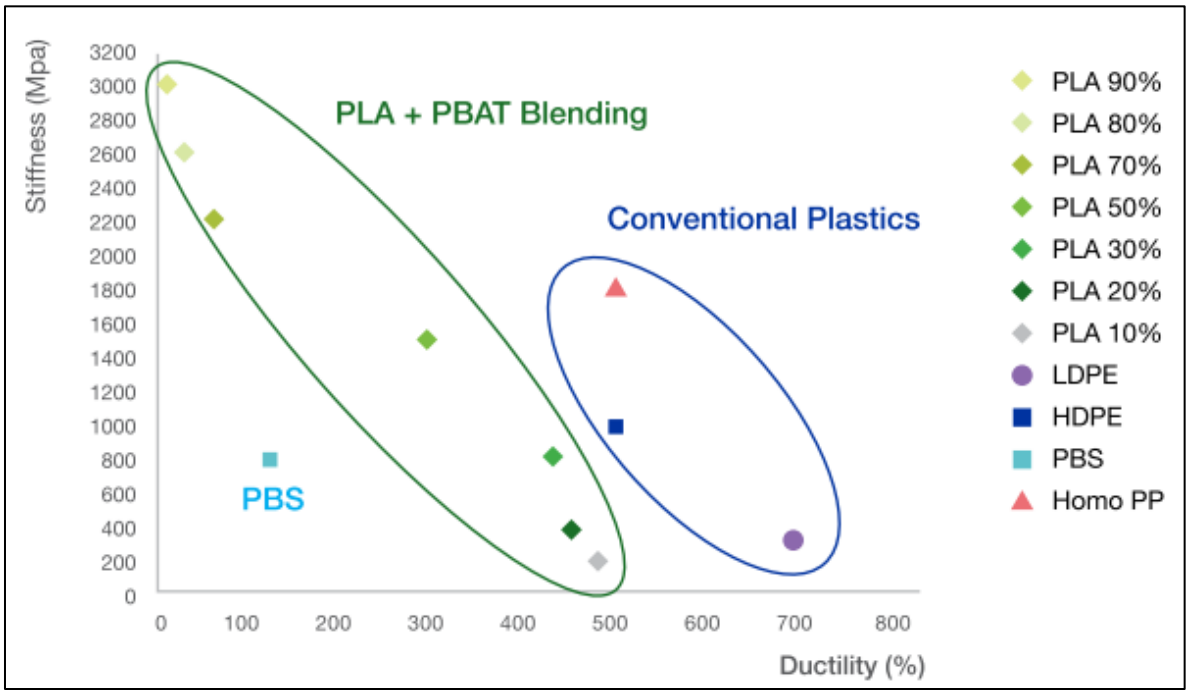
- **High Tensile Elongation (Flexibility)**
- **High Impact Strength**
- **High Tear Strength**

→ Suitable for Blown Film



PBAT/PLA Blend vs LLDPE/LDPE

- LLPE,LDPE 以及 HDPE 為目前最廣泛運用在塑膠袋上之料種
- PBAT 與PLA摻混後吹膜之加工性與現用塑膠袋相近，且強度、延展性、剛性也相似，可取代現用塑膠袋。
- PBAT為市面上用於膜袋類領域，最常見之可堆肥、可完全生物分解之聚合物。



PBAT Applications

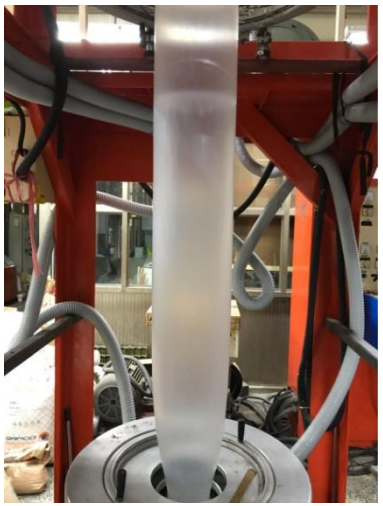
CCP Longlite® Bioplastic Grade List

Grade				CCP LongLite®		
				BT02-203 (標準)	BT12-203(經濟)	BT62-203(耐熱)
Remarks				>PBAT+PLA<	>PBAT+Mineral<	>PBAT+PBS<
Resin Properties	Biodegradability			Industrial Compost		
	Type of Extrusion			Blown		
	MFR@190℃,2.16kg		ISO 1133	g/10min	2	4	3
	Density		ISO 1183	g/cm³	1.25	1.37	1.25
	Shore D Hardness		ISO 868	-	48.7	49.7	49.1
Film Properties	Film Thickness		-	um	20	20	35
	Blow up ratio (BUR)		-	-	2.1	2.1	2
	Tensile Stress	MD	ISO 527	MPa	26.2	25.7	39.2
		TD			18.8	26	26.8
	Tensile Strain	MD	ISO 527	%	141	344	107
		TD			616	827	277
Thermal	HDT(@0.45MPa)		ISO 75	℃	51	59	63
Optical	Light Transmittance		ASTM D1003	%			

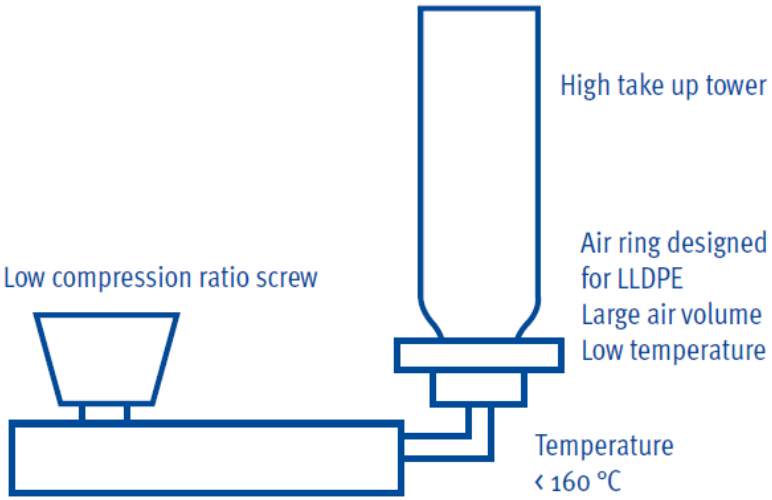
CCP Bio-Product

Grade name	BT02-203	
Application	Blown Film	
Physical Properties	Unit	Value
Density	kg/m^3	1.23-1.26
MI (190℃, 2.16kg)	g/10min	<5
Recommended Processing Parameters		
Machine equipment	Standard LDPE screw	
Machine settings	Unit	Value
Die lip gap	mm	0.8~1.2
Blow Up Ratio	-	2.0~4.0
Melt Temperature Barrel Zone (Rear to Front)	℃	140~160
Die	℃	155
Pre-Drying Temp.	℃	80, 2~4hrs

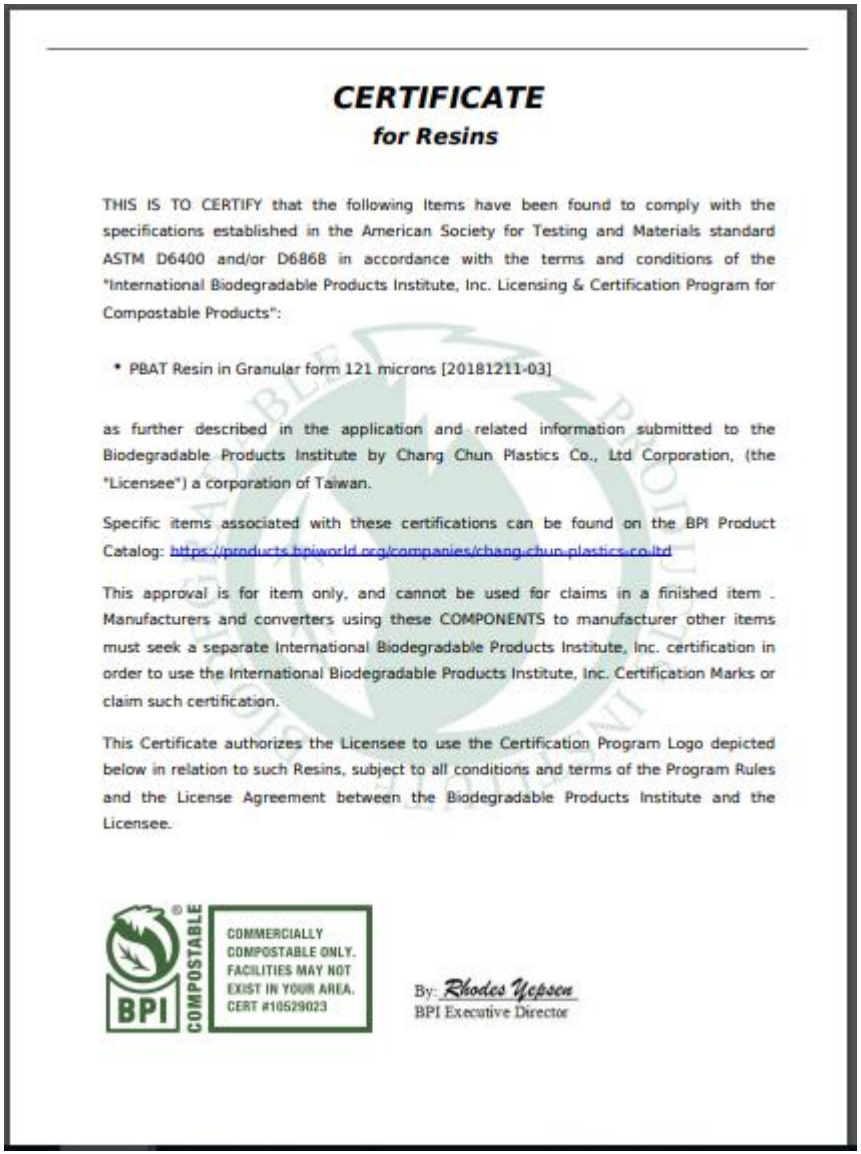
Pilot Scale
Blown Film line



BT02-203
Shopping Bag



BPI & Din Certco Certificate of PBAT resin



CERTIFICATE
for Resins

THIS IS TO CERTIFY that the following Items have been found to comply with the specifications established in the American Society for Testing and Materials standard ASTM D6400 and/or D6868 in accordance with the terms and conditions of the "International Biodegradable Products Institute, Inc. Licensing & Certification Program for Compostable Products":

* PBAT Resin in Granular form 121 microns [20181211-03]

as further described in the application and related information submitted to the Biodegradable Products Institute by Chang Chun Plastics Co., Ltd Corporation, (the "Licensee") a corporation of Taiwan.

Specific items associated with these certifications can be found on the BPI Product Catalog: https://products.bpiworld.org/companies/chang-chun-plastics-co-ltd

This approval is for item only, and cannot be used for claims in a finished item . Manufacturers and converters using these COMPONENTS to manufacturer other items must seek a separate International Biodegradable Products Institute, Inc. certification in order to use the International Biodegradable Products Institute, Inc. Certification Marks or claim such certification.

This Certificate authorizes the Licensee to use the Certification Program Logo depicted below in relation to such Resins, subject to all conditions and terms of the Program Rules and the License Agreement between the Biodegradable Products Institute and the Licensee.

BPI COMPOSTABLE
COMMERCIALLY COMPOSTABLE ONLY. FACILITIES MAY NOT EXIST IN YOUR AREA. CERT #10529023

By: Rhodes Yepsen
BPI Executive Director

DIN CERTCO

CERTIFICATE

Certificate holder	Chang Chun Plastics Co., Ltd. No. 8 Huaxi Rd. Kaohsiung City, Daliao District 83164 TAIWAN
Product	Compostable material for industrial composting
Type, Model	ECO A
Testing basis	DIN EN 13432:2000-12 Certification scheme Products made of compostable materials (DIN-Geprüft) (2017-10)
Mark of conformity	INDUSTRIELL KOMPOSTIERBAR DIN Geprüft
Registration No.	9KD066
Valid until	2026-01-31
Right of use	With this certificate the holder is granted the special entitlement for advertising purposes for the mark of conformity shown above in conjunction with the specified registration number. See annex for further information.

DIN CERTCO

2020-01-08
Dipl.-Phys. Carlo Selser
Head of Certification Body

DAkkS

DIN

DIN CERTCO Gesellschaft für Konformitätsbewertung mbH · Alboinstraße 56 · D-12103 Berlin · www.dincertco.de

PBAT blend for 100% compostable plastic bags

長春集團
Chang Chun Group

- Contact Info.

- **Tel.:** *+886-2-2500-1816* / **Fax:** *+886-2-2500-1889*
- **Add.:** *7th Floor, No. 301, Songjiang Rd., Zhongshan District 10483, Taipei, Taiwan*
- **Web:** *http://www.ccpgp.com*
- **Email:** *Irene_Chen@ccpgp.com, russell_huang@ccpgp.com*

Contact US				
Location	Name	TEL	Mobile	Email
Taiwan	Jason Wu(吳俊誠)	+886-2-25187971	+886-978-218857	Jason_Wu@ccpgp.com
Taiwan	Eddie Chu(朱國寧)	+886-2-25187977	+886-921-941797	Eddie_Chu@ccpgp.com
中部、生分解材料	Russell Huang(黃世佑)	+886-2-25102287	+886-972-162330	Russell_Huang@ccpgp.com
台灣北部、南部	Kevin Yang(楊佳山)	+886-2-25001768	+886-963-168-108	Chiashan_Yang@ccpgp.com