生物高聚有限公司
Bio Polymer Co., Ltd

适用于加图立大学生命工学技术的相关产品
Application product by the Catholic Univ. of Biotechnology

生物塑料(Bio plastics)
- 生物可降解塑料(Biodegradable plastics)
- 氧化生物降解塑料(Oxo-biodegradable plastics)
- 生物基塑料(Bio based plastics)

功能性产品(Functional products)
- 保鲜(Freshness)
- 抗菌(Anti bacterial)
- 防虫(Anti insect)
- 其它(Etc.)

应用产品(Application products)
- 生物塑料(Bio vinyl)
- 生物片材(Bio sheet)
- 注塑成型品(Injection molding)
- 食品包装(Food packaging)
- 农用地膜(Mulching film)
- 工业用品(Industrial supplies)
- 环保包装等(Eco-packaging etc)

bio think green

think green





KBMP (주)바이오소재 Bio Polymer Co. Ltd

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历史 / History

2002 - 2011

Development of raw materials biodegradable polymer
开发生物可降解聚合物原料
Biodegradable pellets, household goods, pacakging materials manufacturing and sales
制造和销售生物可降解性颗粒，生活用品，包装纸等
Patent Registration : Molding Apparatus for Biodegradable Starch Container
专利登记：亲环境生物可降解性淀粉容器的成型装置
Completed the development of bio-based raw materials and products, promote commercialization
开发了生物基原料与产品，并促进生产化
Establishment Biomass Plastics R&D Lab
生物素材研究所的成立
Eco-packaging, Food packaging, Farming&Horticulture products manufacturing and sales
制造和销售环保包装，食品包装，农业园林产品
Establishment Korea Bio material packaging assodiation, Promotion Consortium
设立韩国生物素材包装会与促进协会事业

2012 - 現在

Patent Registration : Biobased Garbage bag and method for producing th ereof
专利登记：生物基垃圾袋
Establishment Biopolymer Co.,Ltd., Oxo-biodegradable materials&Eco-friendly products manufacturing and sales
成立了生物高聚物有限公司，制造和销售氧化生物降解原料，和低碳环保产品
Venture certification, ISO, KBMP certification, R&D center certification, Oxo-biodegradable Certi.
取得了ISO9001, 14001, 企业认证，UAE氧化生物分解认证，KBMP认证，研发中心认证和绿色认证
Patent application : Insecticide, Decrease VOCs, Electro-conductive etc.
专利申请：5件(防虫，导电性，减少挥发性有机化学物质)
Think green products Launching
Think green 产品上市
Jeollanam-do, GFEZ MOU
于全罗南道-光阳经济厅签订协约
Functional(Anti bacterial, Freshness etc.) products
功能性(抗菌，保鲜等)产品上市

绿色认证 Green certification
美国认证 USDA Biobased cetification



Business and academic cooperation forum MOU
与加图立大学 MOU



Governor MOU
大中小企业共同成长协议



VIP ASIA AWARD
VIP亚洲奖



China Guangzhou Exhibition
广州展示会



Jeollanam-do, GFEZ MOU
全罗南道-光阳经济厅签约

个生物塑料的对比 / Compare Features for Each Type of Bioplastics

Division 分类	Bioplastics / 生物塑料				
	Biodegradable plastics 生物可降解塑料		Oxo-biodegradable plastics 氧化生物降解塑料	Bio based plastics 生物基塑料	
	Biomass base 生物质颗粒	Petroleum base 石油界		Combined 结合型	Polymerized 聚合型
Biomass content 生物质含量	More than 50-70%	-	-	More than 20-25%	
Materials 使用原料	Natural, Microbial	Petroleum polymerization	Anticle biodegradable oxidation, plants, etc.	Natural-polymer conjugates	Natural-monomer polymerization
Kind of products 种类	PLA, TPS, PHA, AP, CA etc.	PBS, PES, PVA, PCL, PBAT etc.	Oxo Bio-PE, Oxo Bio-PP etc.	Bio-PE, Bio-PP, Bio-PET, Bio-PA etc.	
Standard 规格标准	ISO 14855 ASTM D 6400 etc.		ASTM D 6954 UAE S 5009	ASTM D 6866 CEN/TR 15932 etc.	
Feature 特征	Biodegradability, Expensive, Poor physical properties		Adjustable period of degradation, oxidative degradation	CO_2 reduction, physical properties, Water resistance	
Degradation mechanisms 分解过程	Microbial degradation		Microbial degradation following oxidative degradation	-	
Plastics 塑料	Not use		Use	Use	
Biodegradation period 可降解期	6 months or less 6 months 90% or more		36 months 6 months 60% or more	-	

生物塑料母粒 M/B / Bioplastics Pellet, M/B



Fine Powder



M/B Processing



Core technology*
- **Dehydration period conditioning**
  : 6month~more than 10 years
- **Cost reduction**
  : Using low-cost plant
  biomass & process flow ability
- **Dehydrate** : moisture → forming
- **Water-stable coating**
- **Heat-resistancy** : Preventing carbonization
- **Improvement of property**
  : Melt Index, Miscibility etc.



Bio Pellet



Core technology*

原料特征 / Product Features

价格竞争力 (Price Competitiveness)	碳抵减 (Reduction of Carbons)
- 对于其它公司的类似产品具有价格竞争力 - Maintaining competitiveness in price compared with eco-friendly products of other companies	- 和一般塑料对比，二氧化碳成分少 - Reduction of CO_2 compared with plastics
多样的应用 (Various Applications)	**品质优良 (Outstanding Properties)**
- 抗菌，防虫/ Antibacterial, insect proof - 延长保鲜时间/ Maintaining freshness - 除湿功能 / Dehumidification - 土木、建筑原材料 / Civil engineering building materials - 工业用品，日常用品等广泛应用/ Various application	- 耐热性(120℃) / Thermal resistance(120℃) - 产品强度强/ High strength of products - 再利用性 / Outstanding recyclability - 耐水性，耐油性强/ Well waterproof and oil proof - 微波炉中可使用/ Microwavable

※ 注意事项 / Precaution
- 具有吸水性，所以开封后就尽快使用
- We recommend you to use it immediately after unsealing it as it could absorb moisture



BBP(Bio Based)



TGR-010 添加剂
(Oxo-bio Additive)



TGR-001 添加剂
(Oxo-bio Additive)



EH-X 添加剂
(Freshness Additive)

原料的种类 / Grade

产品名 (Product name)	特征 (Characteristic)	种类 (Types)	销售单位 (Sales unit)
TGR®	氧化生物降解 Oxo-biodegradable	TGR-001, TGR-010 等 TGR-001, TGR-010 etc.	1, 5, 25kg
BBP®	碳抵减 Carbon neutral	粗康, 木炭, 咖啡等 Chaff, charcoal, coffee etc.	1, 5, 25kg
EH-X	保鲜，适用范围广 Freshness prolongation, Variety application	EH-X, EH-X plus, EH-X premium	1, 5, 25kg

※ 大量购买时，另行商议 / Separate when a large purchase counseling
- 请拨打我们的客服电话. (+82 –2-6238-6283)
- Please contact the Customer Center (+82-2-6238-6283)

TGR 应用销售产品 / TGR Application Sales Products



香烟外包装-KTNG
Outer packaging of cigarette-KTNG



食品&功能性包装
Food&functional packaging



协会袋
Vinyl – KBMP

Think Green 产品 / Think Green Products

■ 产品照片



生物卫生手套(20张)
Bio sanitary grove(20EA)



生物保鲜袋(34 / 50张)
Bio sanitary grove(34/50EA)



亲环境纸张箔(20m)
Eco paper foil(20m)

■ 大小资料

品名 (Product name)	代码 (Code)	产品尺寸 (Contents size)	单件包装 (Single packing)	箱子包装 (Box packing)
生物卫生手套(20张) Bio sanitary grove(20EA)	TG-G-020-0030021	24*28cm	186 X 155 X 3 mm	245 X 400 X 175mm(80EA)
生物保鲜袋(34张) Bio sanitary grove(34EA)	TG-B-034-052008	17*25cm	165 X 75 X 30 mm	240 X 400 X 345mm(70EA)
生物保鲜袋(50张) Bio sanitary grove(50EA)	TG-B-050-0340051	25*35cm	224 X 88 X 40mm	295 X 460 X 470mm(70EA)
亲环境纸张箔(20m) Eco paper foil(20m)	TG-P-020-00120056	30cm X 20m	310 X 51 X 51mm	555 X 330 X 280mm(50EA)

※ 产品种类多(数量，大小可变更) / A variety of products as possible(Quantity, size changeable)

主要客户 / Major Client

KT&G · 한살림 · JW 중외제약 · emart · NH농협
KORAIL · Domino's · CJ CHEILJEDANG · 유한양행 · LOTTE Mart
NAVER · Home plus · Hyundai Card · J+K STUDIO · AMOREPACIFIC
'TORAY' 도레이케미칼 · EVERLAND RESORT · SEOUL DESIGN OLYMPIAD 2008 · MINI STOP · SINCE1897

功能性产品 / Frunctional products

■ 保鲜 / Freshness






种类 / Types

- **EH-X** : 保鲜 / Freshness
- **EH-X plus** : 保鲜+抗菌 / Freshness + Antibacterial
- **EH-X premium** : 保鲜+抗菌+防虫 / Freshness + Antibacterial + Insect proof

应用领域 / Application fields

- **在常温下具有保鲜功能/ Freshness Prolongation at room temperature**
  - 对新鲜食品具有保鲜效果
    : 亲环境类似生体膜研究课题完成结果
  - Effective in fresh food
    : Eco-friendly similar bio-membrane research subject (Korea Food Research Institute) → thesis published
  - 建议用于类似大米包装等可持续性消费的产品
  - Encourage application for rice packaging and sustainable consumption items
  - 涂层剂喜制造
  - Produce coatings, apply to pulp molding

- **抗菌功能 / Antibacterial Function**
  - 对兰阴性、革兰阳性菌等的效果：亲环境类似生命体研究课题进行结果
  - Gram negative, Gram positive, Virus extinction
    : eco-friendly similar bio-membrane research subject (Ministry for Food and Agriculture)

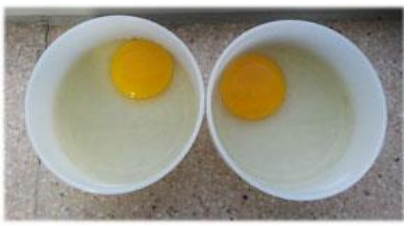
- **除臭功能(可以减少VOC) / Deodorization(VOC reduction)**
  - 汽车内装材料，袜子，内衣等 → 具有抑制有害菌的效果（同时具有杀菌功能）如：除臭与脚气
  - Car interior material, socks (military use), underwear, etc.
    → removal effect of harmful germ such as deodorization and athlete's foot (sterilization effect as well)
  - 可以减少VOC， 如：甲醛，二甲苯，甲苯等
  - VOC reduction effects reduction of formaldehyde, xylene, toluene, etc.

应用产品 / Application products






主要实验结果 – 延长保鲜时间/ The main experimental data – Freshness prolongation

	对照区 / Control	应用产品 / Applied products
塑料袋 (第15天) Vinyl (15 days past)		
容器 (第15天) Container (15 days past)		

生物硅， 注塑品 / Bio Silicon, Injection Molding

- 使用可降解树脂、碳中立型生物质颗粒（淀粉、玉米杆等植物体），纳米微粒子，食品添加剂等对人体无害的原料
  → 使用后，在自然环境中被生物分解，从而使环境得到保护
- 对人体无害，可以入嘴中或直接和食物接触
- 在热的食物、开水中不会因高温而变形
- 有效地减少二恶英等有害物质的排放
- 可以回收再利用
- 产品种类多，使用范围广：幼儿童，成人，商业等

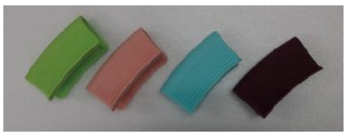
- When discarded, biodegrades in nature due to the main materials : natural substance, biomass, oxo-biodegradable additive, minerals, etc.
- Is harmless to the body and safe to put in the mouth or come in direct contact with food
- No heat deflection in boiling water or when in contact with hot food
- Excellent in reducing harmful to the body materials such as dioxin and heavy materials
- Recyclable, Reusable
- Diverse products available : Baby, Adult, Business products



生物注塑品
Bio injection molding



生物硅-密封容器
Bio silicon airtight container



生物硅-把手
Bio silicon grip



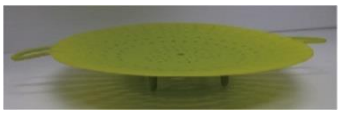
生物硅-制冰格
Bio silicon ice cube



生物注塑品
Bio injection molding



生物硅-菜板
Bio silicon cutting board



生物硅-蒸器
Bio silicon steamer



生物硅-婴儿用勺子
Bio silicon baby spoon

主要产品 / Major Products



Think green 产品
Think green products



生物塑料
Bio vinyl, flim



一次性用品
Disposable products



保鲜膜，拉伸胶片
Plastic wrap, Stretch film



纸制豆腐容器
Tofu container-Pulp



纸制缓冲托盘
Buffer tray-Pulp



办公用品
Office supplies



纸制用品
Paper, Pulp



农用地膜
Mulching film



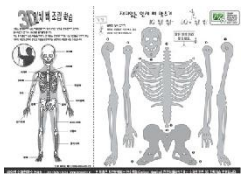
幼苗培养器皿
Breed sprout kit



食品包装
Food & functional packaging



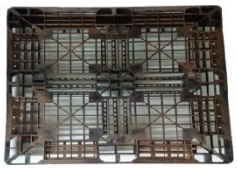
缓冲托盘 – 生物片材
Buffer tray



骨头-教区
Bone assemble
-Teaching aid



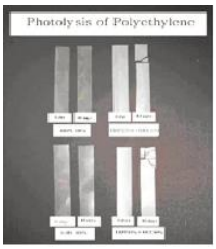
汽车内饰门
Car door trim

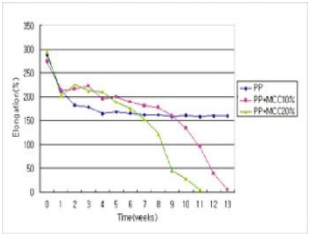


托盘
Pallet
(1100X1100mm)

生物塑料实验数据 / Bio plastics Test Data

Pyrolysis&photolysis test / 热分解与光分解实验



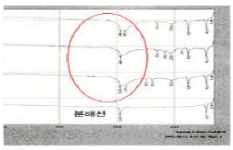


Pyrolysis&photolysis - Modified ASTM D 5510
- 68℃, humidity 85%, UV

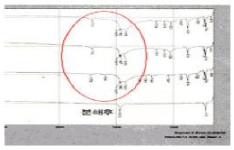
Molecular weight decrease & Carbonyl group test / 分子量减少实验

Hour	TGR-001	Other company
300	5,050 Da	42,000 Da
400	3,800 Da	21,000 Da
700	Test end	7,500 Da
900		6,060 Da
1,400		5,010 Da

- ASTM D 6954 Tier 1 方式, 340nm, 50 ℃
  ASTM D 6954 Tier 1. 340nm, 50℃
- OPP Film, 1%添加剂使用, GPC220
  OPP film, 1% additive, GPC220.
- TGR:分解速度约快4倍以上
  TGR is 4 times faster degradation than the other company



分解前 / Before Degradation

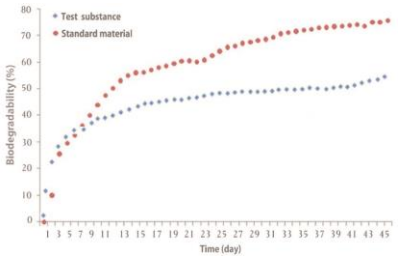


分解後 / After Degradation

- Molecular weight decrease in 3,800~5,300 after degradation
- 40 days exposure to UV, the film was found in carbonyl groups
- 120 days exposure to heat, the film was found in carbonyl groups.

Biodegradable test / 可降解实验

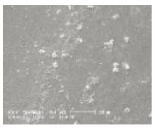
Contents	Biodegradabilty	Period
Standard material	77.30%	45days
Test substance	55.40%	45days
Compared to Reference material	71.60%	45days



Curve of biodegradability calculated by the average

Microorganism cultivation test / 微生物培养实验

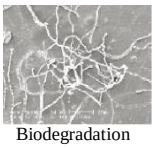
- ASTM G22 : 37℃, relative humidity 85%, 60days
- SEM : X 1,000



PE film



Oxo-biodegradation



Biodegradation

Mulching test / 覆盖实验

- Target crop : Chili(Red pepper)
- Test period : '05.4~'05.11 (7months)
- Joint research of Rural Development Administration

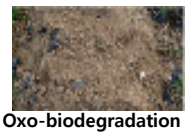


← Initial installation

↓ 7 months later



PE film



Oxo-biodegradation



Biodegradation

Toxicological test / 人体无害实验
FDA, USDA, KFDA accreditation

1) FDA



Biodegradable pellet
KBMP-900S
Test report

2) USDA



Biobased pellet, packaging
ASTM D 6866 test report
- Radio carbon(C14) %
- Pellet(M/B) : 39%
- Product : 35%

3) KFDA

Test item			Unit	Standards & Specifications	Test result
Materials test	Pb		Mg/kg	Below 100 (In total)	Non detection (Detection limit 1)
	Cd				Non detection (Detection limit 1)
	Hg				Non detection (Detection limit 0.1)
	Cr6+				Non detection (Detection limit 1)
Migration test	Heavy metal by Pb			Below 1.0	Below 1.0
	Potassium permanganate consumption			Below 10	1
	Reciduce Evaporated	By 4% acetic acid	Mg/L	Below 30	10
		By H_2O		Below 30	4
		By n-heptane		Below 150	9
		By 20% ethanol		Below 30	3
Test method	Korean Food Standards Codex 6, Standards and specifications : packaging of appliance and containers				

Eco-friendly packaging(product) test report

Bio plastics Test Data / 资格证书



Venture Certification
风险认证



R&D Center
企业附属研究所认证



Patent registration 5
Patent application 7
专利登记5个



Oxo-biodegradable Certi.
氧化生物降解认证



Biodegradable Certi.
氧化降解认证



Green certification
绿色认证



USDA certification
美国认证



ISO 9001
ISO 14001

EH-X
Trade Mart
商标注册