

Do you know [“Disposable Paper Meal Box”?]

In a cuppa

25,000 particles
Micro-plastics

Drinking tea or coffee from paper cups may raise risk of cancer from swallowing micro-plastics , experts warn.

The Daily Mail, 2020

“Invisible Plastic” —Water-based Coating

Water based coating contained monomer chemical, in order to enhance the oil and water proof ability, all water-based coating included thermoplastic segment. The monomer chemical and thermoplastic segment polymerized during the evaporation of water. After the evaporation of water, the remaining solid polymer will form a coating on the surface of the cup.

Most food packaging contains **Carcinogenic PFAS**

Perfluorinated and polyfluoroalkyl substances (PFAS) is widely used in paper packaging and containers because of its excellent water and oil resistance. PFAS gives food packaging heat-resistant, Water, oil and corrosion resistance. However, PFAS tend to accumulate in the environment and the human body. And it's hard to break down. Potentially toxic to humans and animals.

Consumer Report,2022

WHY CHOOSE **ecoinno**®?

Reconstruct 100% biodegradable plant fibres, we create a super performance new material replacing plastic.

The current Disposable Paper Meal Box

Water-based plastic linings and PFAS are commonly used to enhance performance.

✓	No Plastic Lining	Plastic Lining: Microplastics migrate into food	✗
✓	No Water-based Coating	Water-based Coating: Microplastics migrate into food.	✗
✓	No Toxic PFAS	Toxic PFAS leach into food	✗
✓	Low Temp. Resistant -196°C ~ High Temp. Resistant 220°C	Can not withstand High Temperature	✗
✓	Microwave, Oven, Steamer, Air fryer Safe	Prolonged heating can lead to the release of toxic chemicals	✗
✓	Biodegradable in soil at normal temperature within 75 days	Laminated paper is not biodegradable	✗

2. ARE YOU AWARE PAPER CONTAINERS AND PAPER CUPS ARE LAMINATED WITH PLASTIC?

你知道紙容器和紙杯是用塑料貼膜的嗎？



Plastic is now in humanity's blood.

Microplastics are carcinogenic to humans.

Scientists have found that microplastics can cross the hardy membrane that protects the brain from foreign bodies in the bloodstream. The chemicals leaching out of these plastics can cause long-term medical effects.

微塑膠對人類致癌。

科學家發現，微塑膠可以穿過血液中那些本應保護大腦免受異物侵害的細胞膜。這些從塑膠中釋出的化學物質會引發慢性疾病。

Down to Earth, 2021



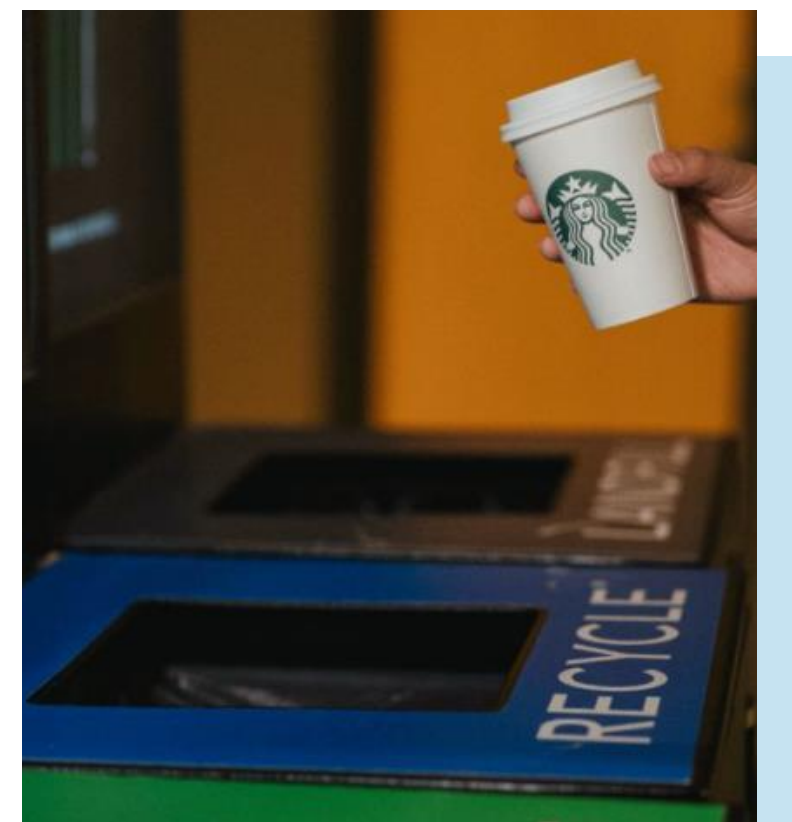
Starbucks "Paper" Cup Failed Recycling.

Starbucks' cup is coated with a compostable plastic liner. However, recycling facilities do not separate paper cups from their linings. When the cups end up in recycling plant, they gum up machines and harm the equipment.

星巴克"紙"杯不能回收。

星巴克咖啡杯內層有塑膠覆膜，這種材質給回收帶來很大難度。杯子使用了可分解覆膜，但回收機構無法將其剝離，整杯進入回收設備後會對設備造成損壞。

CNN Business, 2020



Biodegradable Plastic did not Degrade as Claimed.

Study showed, plastic bags that claim to be biodegradable were still intact and able to carry shopping three years after being exposed to the marine and soil environment.

可生物降解塑膠不能真正降解。

研究發現市場上「可生物降解」膠袋在土壤及海洋中，三年後應然能夠使用，未分解。

The Guardian 2019



EU RESTRICTION OF PLASTIC PRODUCTS DIRECTIVE (EU 2019/904)

歐盟限制塑料制品指令 (EU 2019/904)

On 1 June 2021, the final guidelines for Directive (EU) 2019/904 on single-use plastics were published.

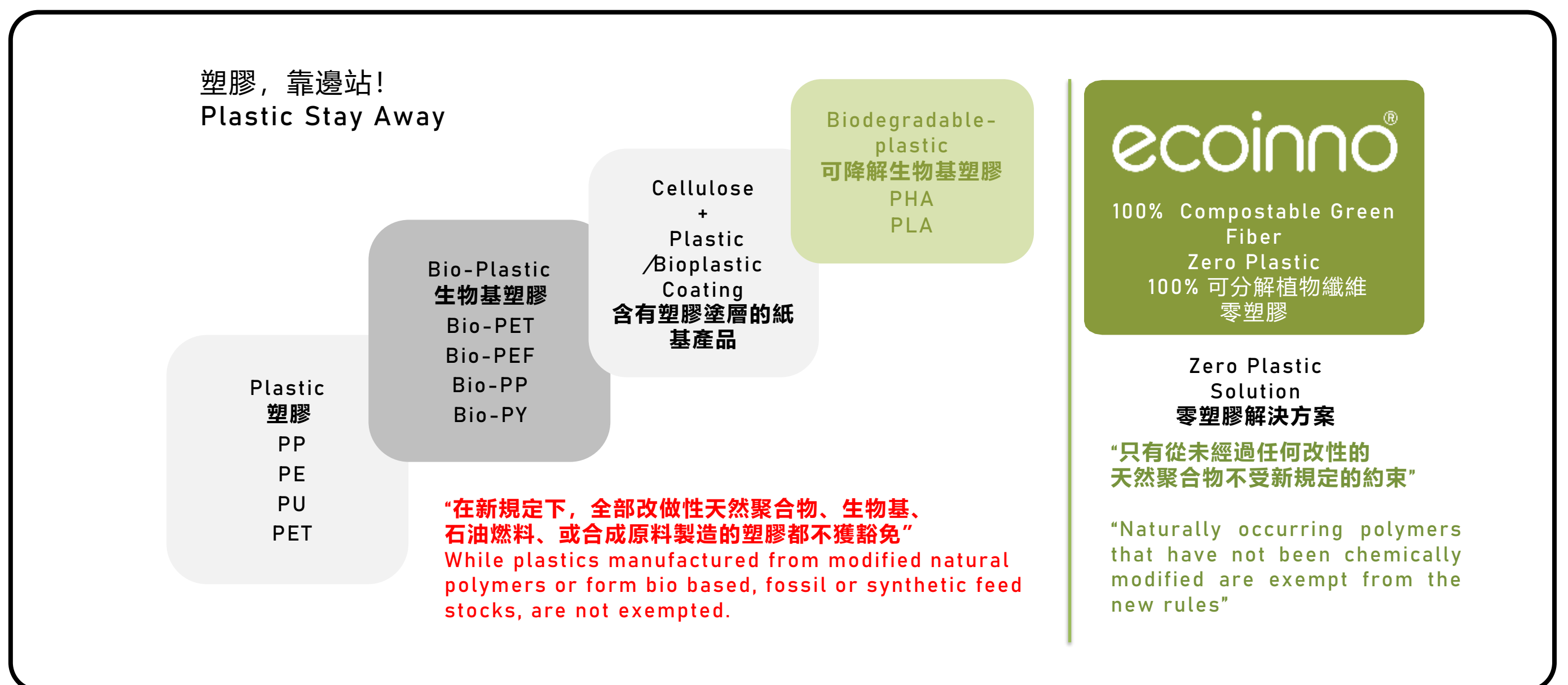
Naturally occurring polymers that have not been chemically modified (**Plant fiber**) are exempt from the new rules, while plastics manufactured from modified natural polymers (**PHA**), or from bio-based (**PLA**), fossil or synthetic feedstocks (**PP**, **PE**), were not.

2021年7月1日關於一次性塑膠的指令(EU) 2019/904的最終指南發佈

未經化學處理的天然聚合物(**植物纖維**)不受新指令的約束，而塑膠由改性天然聚合物 (**PHA**) 或生物基 (**PLA**)、化石石油提煉物或合成原料(**聚丙烯PP**、**聚乙烯PE**) 則受新指令約束。



Plastic News, 2019



3. MICROPLASTICS AFFECT HUMAN HEALTH 微塑料影響人類健康

Microplastics found in human blood and lungs for the first time
Scientists found microplastics particles in almost 80% of the people tested. A recent study found that microplastics can [latch on to the outer membranes of red blood cells](#) and may limit their ability to transport oxygen.

首次在人體血液及肺部中發現微塑膠

科學家在近 80% 的被測人身上發現了微塑膠。最近的一項研究發現，微塑膠可以附著在紅細胞的外膜上，並可能限制它們輸送氧氣的能力。



Guardian, 2022

4. THE RULINGS OF BANNING SINGLE USE PLASTIC (SUP) AROUND THE WORLD

全球禁止使用一次性塑料的規定

Region 地區	Single Use Plastic Policies 一次性塑料政策
Mainland China 中國內地	<p>The Ministry of Commerce and the National Development and Reform Commission jointly issued the "Administrative Measures for the Use and Reporting of Disposable Plastic Products by Business Operators" on May 16, 2023, which will come into effect on June 20, 2023, prohibiting and restricting the use of non-degradable single use plastic products. Requires catering operators to advocate the use of degradable packaging and tableware for takeaway service.</p> <p>國家商務部、發改委於2023年5月16日聯合發佈《商務領域經營者使用、報告一次性塑膠製品管理辦法》，從2023年6月20日起施行，依法禁止、限制使用不可降解塑膠袋等一次性塑膠制，並要求餐飲經營者在向消費者主動提供打包服務時，宣導使用可降解打包、外賣餐盒餐具。</p>
Hong Kong, Macau and Taiwan, China 中國港澳臺	<p>Taiwan: Plans to gradually ban the use of single-use foam and plastic tableware (including tableware and food containers) for dine-in and takeaway services in the catering industry by 2025. In response to environmental trends in different countries and regions, the consumption of plastic packaging and non-renewable plastics will be gradually restricted and replaced.</p> <p>臺灣：計畫在2025年前逐步禁止餐飲業堂食和外賣服務使用一次性塑膠泡沫和塑膠餐具（包括餐具和食品容器）回應各國家和地區的環保趨勢，對塑膠包裝及不可再生塑膠的消費進行逐步限制和取代。</p> <p>Hong Kong: The Government noted that the Legislative Council passed the Product Eco-responsibility (Amendment) Bill 2023 for regulating disposable plastic tableware and other plastic products, and for enhancing two existing producer responsibility schemes (PRS) on October 18 . The first-phase regulation will be implemented from April 22, 2024. Eventually all Oxo-degradable plastic, PLA, Polyethylene, and all paper product coated with plastic and bio plastic will then be banned. Natural materials without chemically modified such as: rice, wheat, plant fibers, etc. can be used.</p> <p>香港：政府表示立法會2023年10月18日通過《2023年產品環保責任（修訂）條例草案》，以管制即棄塑膠餐具和其他塑膠產品，以及優化兩個現行生產者責任計畫，第一階段管制於2024年4月22日開始實施。氧化降解塑膠、PLA、聚乙烯和所有塗有塑膠和生物塑膠的紙製品將被逐步被禁止使用。未經化學改造的天然材料如：大米，小麥，植物纖維等則可使用。</p> <p>MACAU: THE LIST OF BANNED PLASTIC ITEMS IN MACAO IS GROWING: Styrofoam meal boxes, bowls and cups have been banned in Macao since the start of 2021. Single-use plastic straws and drink stirrers were banned in January 2022. Plastic cutlery will be prohibited from the start of 2024, Macau Post Daily reports.</p> <p>澳門：據《澳門郵報》報導，自 2021 年初起，澳門將禁止使用聚苯乙烯泡沫塑料餐盒、碗和杯子。自 2022 年 1 月起，將禁止使用一次性塑膠吸管和飲料攪拌器。自 2024 年初起，將禁止使用塑膠餐具。</p>
South Australia, Australia 南澳大利亞， 澳大利亞	<p>July 2022, phase out plastic packaging products with additive fragmentable technology(fossil-based/oxodegradable plastics) that do not meet industrial or home compostable standards (AS4736-2006, AS5810-2010 and EN13432).</p> <p>2022 年 7 月，逐步淘汰不符合工業或家庭堆肥標準（AS4736-2006、AS5810-2010 和 EN13432）採用添加劑破碎技術的塑膠包裝產品(化石石油提煉塑膠/可氧化降解塑膠)。</p>
Canada 加拿大	<p>Starting from December 20, 2022, the implementation of "no production, no import, no export" includes prohibiting companies from producing or importing SUP bags and takeaway boxes, no longer selling SUP products by the end of 2023, and banning SUP export by the end of 2025.</p> <p>自2022年12月20日開始，實施“不生產、不進口、不出口”包括首先禁止公司生產或進口一次性塑膠袋和外賣盒，2023年底不再銷售一次性塑膠製品，2025年底禁止出口一次性塑膠製品。</p>
European Union 歐洲聯盟	<p>The EU issued SUP Directive (EU 2019/904) in 2019, fighting the SUP impact on the environment. Naturally occurring polymers that have not been chemically modified (Plant fiber) are exempt from the new rules , while plastics manufactured from modified natural polymers (PHA), or from bio-based (PLA), fossil or synthetic feedstocks (PP, PE), were not.</p> <p>歐盟於 2019 年發佈了一次性塑膠指令 (EU 2019/904)，以對抗一次性塑膠對環境的影響。未經化學處理的天然聚合物(植物纖維)不受新指令的約束，而塑膠由改性天然聚合物 (PHA) 或生物基 (PLA)、化石石油提煉物或合成原料(聚丙烯PP、聚乙烯PE) 則受新指令約束。</p>
Japan 日本	<p>From 2022, a law to reduce the use of SUP products, including straws and tableware, will take effect in Japan. Proactively promoting the use of various environmentally friendly recyclable and degradable materials, providing substantial government support.</p> <p>自 2022 年起，減少一次性塑膠製品使用的法律在日本生效，包括吸管和餐具，大力推動各種環保可循環再生和可降解材料的使用，並給予大量政府支援。</p>
United States 美國	<p>Since 2018, the use of plastic straws and cutlery have been banned in individual states</p> <p>2018年起,個別州已禁止使用塑膠吸管和餐具。</p>

5. THE BANNING OF PFAS CHEMICALS IN PAPER FOOD PACKAGING MATERIAL

禁止 PFAS (防油劑) 用於紙基食品包裝

Banning of PFAS chemicals in food packaging passed in key United States Senate committee

This bill prohibits food packaging that contains intentionally added PFAS, which will begin in 1, Janurary, 2024

美國參議院主要委員會通過禁止食品包裝中的 PFAS 化學品
法案禁止含有意添加 PFAS 的食品包裝, 該法案將於 2024 年 1 月 1 日開始實施。

EWG, 2022



Denmark becomes the first country to ban PFAS in Food Contact Paper and Board

The banning of PFAS chemicals law became effective on July 1, 2020

丹麥成為第一個禁止紙質食品包裝中使用 PFAS 的國家
禁用 PFAS 化學品法於 2020 年 7 月 1 日生效

ORDER NO. 681 OF MAY 25, 2020 ON FOOD CONTACT MATERIALS AND PENAL CODE FOR VIOLATION OF RELATED EU ACTS LOVTIDENDE A, MAY 27, 2020			
Substance	Scope	Requirement	Effective Date
PFAS Chemicals	Food contact paper and board materials and articles	Prohibited	July 1, 2020*

SGS, 2020



6. HONG KONG GOVERNMENT - BANNING OF SINGLE USE PLASTIC 2023

香港政府 - 2023 年禁塑方案明確落實

FoodSmart Conference and Expo 2022

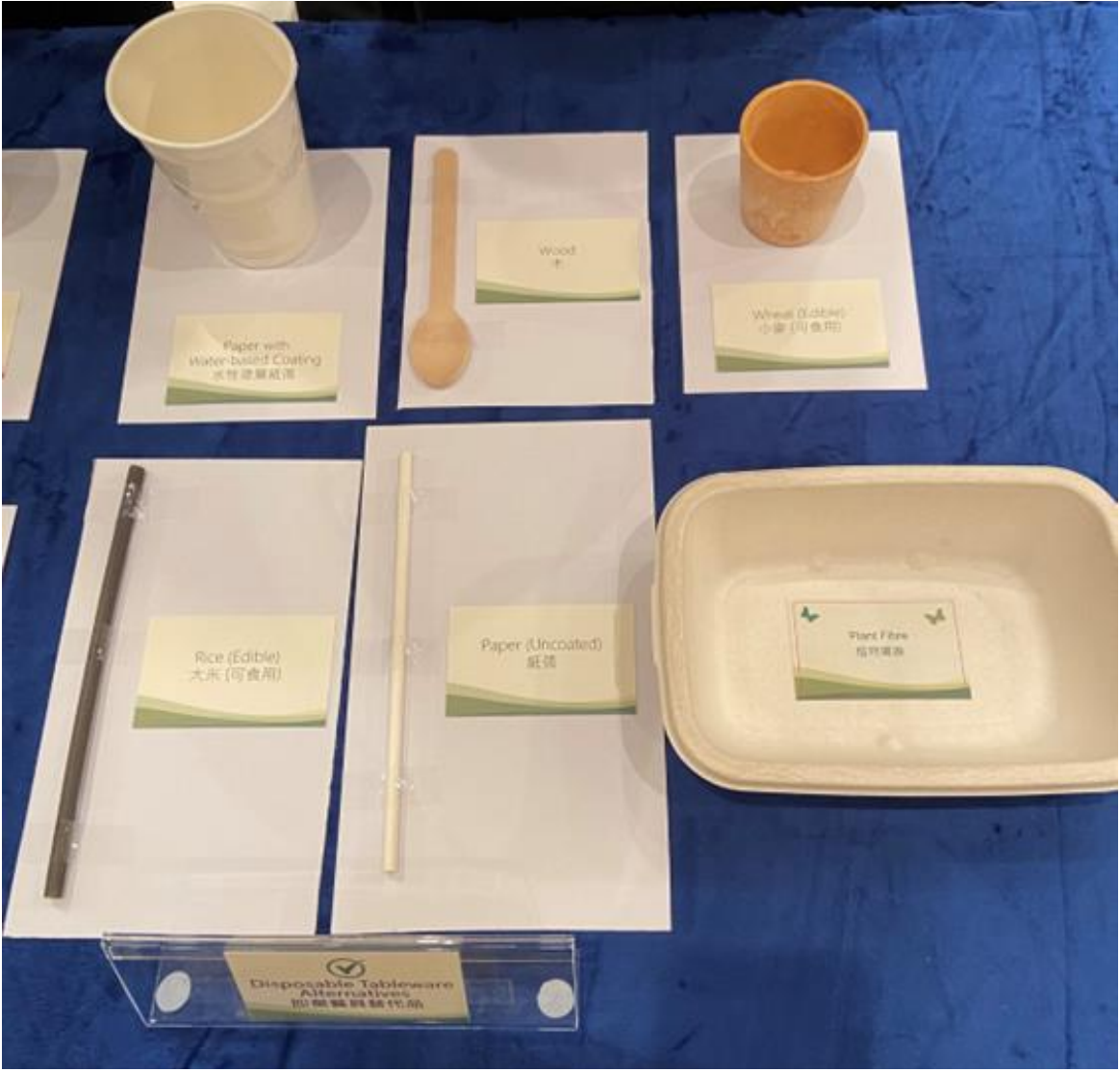
Hong Kong Government (EPD) lists the materials to be prohibited progressively from Q4 2023 via legislative ordinance. Eventually all Oxo-degradable plastic, PLA, Polyethylene, and all paper product coated with plastic and bio plastic will then be banned.

Ecoinno product, 100% plant fiber, is allowed by EPD.

「星星相惜」餐飲業環保會議及展覽2022

香港政府 (環保署) 現正透過立法程式擬從 2023 年第四季度逐步禁止一次性塑膠物料。氧化降解塑膠、PLA、聚乙烯和所有塗有塑膠和生物塑膠的紙製品將被逐步被禁止使用。

Ecoinno 產品, 100% "植物纖維", 被 EPD 列為可用材料。



Disposable Tableware Alternatives

- Plant Fiber
- Wheat (Edible)
- Rice (Edible)
- Wood
- Paper (Uncoated)
- Paper with Water-based Coating

即棄餐具代替品

- 植物纖維
- 小麥 (可食用)
- 大米 (可食用)
- 木
- 紙 (無塗層)
- 水性塗層紙張



Banned Disposable Plastic Tableware

- Expanded Polystyrene (EPS)
- Polylactic Acid (PLA) + Coffee Ground
- Polylactic Acid (PLA)
- Oxo-degradable Plastic
- Paper with Polyethylene Lining
- Paper with Oxo-degradable Plastic

禁用一次性塑膠餐具

- 發泡聚苯乙烯 (EPS)
- 聚乳酸 (PLA) + 咖啡粉
- 聚乳酸 (PLA)
- 氧化降解塑膠
- 聚乙烯塗層
- 含有可氧化降解塑膠的紙基產品

7. MACAU – THE LIST OF BANNED PLASTIC ITEMS IN MACAO IS GROWING

澳門禁用塑膠製品清單不斷增加

the
macao
news 
EST 2008



The list of banned plastic items in Macao is growing



Styrofoam meal boxes, bowls and cups have been banned in Macao since the start of 2021. Single-use plastic straws and drink stirrers were banned in January 2022. Plastic cutlery will be prohibited from the start of 2024, Macau Post Daily reports.

據《澳門郵報》報導，自 2021 年初起，澳門將禁止使用聚苯乙烯泡沫塑料餐盒、碗和杯子。自 2022 年 1 月起，將禁止使用一次性塑膠吸管和飲料攪拌器。自 2024 年初起，將禁止使用塑膠餐具。

28 JUNE 2023

BY STAFF REPORTER

The local government intends to add plastic plates, plastic cups and disposable Styrofoam plates to the list of banned non-biodegradable, single-use imports.



structural component of the coating.

Does aqueous lining / water-based coating contain plastic?

In short, yes. Aqueous lining is a water-based dispersion system of polymers and additives to create a food-safe, grease-resistant barrier. Although aqueous lining contains a relatively small number of polymers compared to its more conventional alternatives, PE (Polyethylene) and PLA (Polylactic Acid), it cannot be considered completely plastic-free.

Does aqueous lining / water-based coating contain plastic?

In short, yes. Aqueous lining is a water-based dispersion system of polymers and additives

水性襯裡/水性塗料是否含有塑膠？

是的。水性襯裡是聚合塑膠和添加劑

8. CHINA – 《Three Years Action Plan for Accelerating the Innovation and Development of Non-food Bio-Based Materials

中国发布《加快非粮生物基材料创新发展三年行动方案》

TK生物基材料获悉：12月29日，工业和信息化部、国家发展改革委、教育部、财政部、中国人民银行、税务总局、金融监管总局、中国证监会等八部门联合印发《关于加快传统制造业转型升级的指导意见》，提出到2027年，我国传统制造业高端化、智能化、绿色化、融合化发展水平明显提升，有效支撑制造业比重保持基本稳定，在全球产业分工中的地位和竞争力进一步巩固增强。

《指导意见》共六个部分18条，其中：在“（八）实施重点领域碳达峰行动”提到：积极发展应用非粮生物基材料等绿色低碳材料。建立健全碳排放核算体系，加快建立产品碳足迹管理体系，开展减污降碳协同创新和碳捕集、封存、综合利用工程试点示范。

在“（十二）促进行业耦合发展”提到：推进石化化工、钢铁、有色、建材、电力等产业耦合发展，推广钢化联产、炼化集成、资源协同利用等模式，推动行业间首尾相连、互为供需和生产装置互联互通，实现能源资源梯级利用和产业循环衔接。大力发展生物制造，增强核心菌种、高性能酶制剂等底层技术创新能力，提升分离纯化等先进技术装备水平，推动生物技术在食品、医药、化工等领域加快融合应用。支持新型功能性纤维在医疗、新能源等领域应用。搭建跨行业交流对接平台，深挖需求痛点，鼓励企业开展技术产品跨行业交叉应用，拓展技术产品价值空间，打造一批典型案例。

The "Guiding Opinions" has a total of 18 articles in six parts, of which: in the "(8) implementation of carbon peak action in key areas," it is mentioned that the active development and application of green low-carbon materials such as non-food bio-based materials. Establish and improve the carbon emission accounting system, accelerate the establishment of product carbon footprint management system, carry out pollution reduction and carbon reduction collaborative innovation and carbon capture, storage, comprehensive utilization project pilot demonstration.

Dec, 2022

首页 > 政策 > 国务院政策文件库 > 国务院部门文件

字号：默认 大 超大 | 打印 收藏 ☆ 留言

标题：工业和信息化部等六部门关于印发加快非粮生物基材料创新发展三年行动方案的通知

发文字号：工信部联原〔2023〕5号

主题分类：工业、交通\其他

成文日期：2023年01月09日

发文机关：工业和信息化部 发展改革委 财政部 生态环境部 农业农村部 市场监管总局

来源：工业和信息化部网站

公文种类：通知

工业和信息化部等六部门关于印发加快非粮生物基材料创新发展三年行动方案的通知

工信部联原〔2023〕5号

各省、自治区、直辖市及计划单列市、新疆生产建设兵团工业和信息化、发展改革、财政、生态环境、农业农村、市场监管主管部门，有关中央企业，有关行业协会：

现将《加快非粮生物基材料创新发展三年行动方案》印发给你们，请结合实际认真贯彻落实。

工业和信息化部
国家发展和改革委员会
财政部
生态环境部
农业农村部
国家市场监督管理总局
2023年1月9日

附件：加快非粮生物基材料创新发展三年行动方案

Jan, 2023

Notice of the Ministry of Industry and Information Technology and Other Six Departments on Issuing the Three-Year Action Plan for Accelerating the Innovation and Development of Non-food Bio-Based Materials



Develop cellulose-based solutions to reimagine industrial and engineering material needs

Zero plastic solution BY Ecoinno

100% Biodegradable
Circular Economy

100%可生物降解 循環經濟

Zero PFAS 零PFAS

After use food containers will decompose in natural home compost condition within 75 days

使用過的食物容器將在 75 天內在自然家庭堆肥條件下分解

Mixed with food waste to convert into clean energy

可與廚餘混合轉化成清潔能源



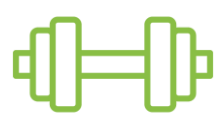
100% Biodegradable
100% 可降解植物纖維素



High Temperature tolerance
up to 220°C
(PP* temp. tolerance < 82.5°C)
耐溫程度 到達 220°C
(PP* 耐溫程度 < 82.5°C)



High Performance
Light, oil resistance,
low temperature tolerance (-196°C)
高性能, 輕量化, 防油, 耐低溫 (-196°C)



Recyclable
Sustainable
可循環性
可持續發展



Barrier- Oxygen Transmission Rate
阻隔性 - 氧氣透氧率
OTR = 0.1 ml/m².24hr
(PP* OTR = 2000 ml/m².24hr)



Tensile strength 125 MPa
(PP* Tensile strength 40MPa)
拉伸強度 125 MPa
(PP* 拉伸強度 40MPa)

*PP= Polypropylene 聚丙烯 (塑膠)



U.S. FOOD & DRUG
ADMINISTRATION



Council of Europe,
Resolution AP
(2002)1



高新技术企业



生产许可



DIN CERTCO



COMMERCIALLY
COMPOSTABLE ONLY.
FACILITIES MAY NOT
EXIST IN YOUR AREA.
CERT #10529116



compostable



TÜV
AUSTRIA
MARINE
S2038



TÜV
AUSTRIA
HOME
S2038



TÜV
AUSTRIA
INDUSTRIAL
S2038