

Plastic materials are widely used in food packaging and containers, and more varieties of them have recently become available in the market. With increasing reports and information of emerging research findings, consumers may have concerns about the safety of plastic materials. A better understanding on plastic materials can help consumers use plastic packaging and containers safely.

What is plastic?

Plastic refers to a large group of materials consisted of polymers, which are composed of many repeating units of monomers, as the basic substances. Other additives such as plasticisers, toughening agents and blowing agents may also be added to modify the performance and processing capabilities of plastic.

What plastic materials are commonly used in food packaging and containers?

The most frequently used plastic materials in food packaging and containers include polyethylene terephthalate (PET or PETE), high density polyethylene (HDPE), polyvinyl chloride (PVC or V), low density polyethylene (LDPE), polypropylene (PP), polystyrene (PS), and polycarbonate (PC).

How to identify the types of plastic materials?

The plastic materials in use can be identified by the plastic identification codes which may be found on the packaging or containers. The most common types of plastic materials used in packaging are represented by the numbers under the plastic identification coding system. Each number is featured inside a triangle of chasing arrows, with the resin abbreviation printed underneath (see table). The coding system was developed by the Society of the Plastics Industry of the United States, which facilitates recycling and recovery of post-use plastics.



The plastic identification codes and properties of the most common plastic materials

Symbol	Type of plastic	Heat resistance	Acid resistance	Alkaline resistance	Alcohol resistance	Oil resistance	Common food contact uses
PET PETE	Polyethylene Terephthalate (PET/PETE)	~80°C	😊	😊	😊	😊	Disposable beverage bottles, oil bottles
	High Density Polyethylene (HDPE)	~75°C	😊	😊	😊	😊	Milk jugs, yoghurt drink bottles
PVC V	Polyvinyl Chloride (PVC/V)	~80°C	😊	😊	😊	😊	Gaskets in metal lids for glass jars, commercial cling films, gloves
	Low Density Polyethylene (LDPE)	~70°C	😊	😊	😊	😊	Cling films, food bags
	Polypropylene (PP)	~140°C	😊	😊	😊	😊	Microwaveable containers, reusable tableware
	Polystyrene (PS)	~95°C	😊	😊	😞	😞	Disposable take-away containers and tableware, yoghurt containers
	Other	Dependent on plastics or combination of plastics					
	Polycarbonate (PC)	~140°C	😊	😞	😊	😊	Reusable beverage bottles
	Melamine-formaldehyde resin (MF)	~120°C	😊	😊	😊	😊	Tableware
	Acrylonitrile Butadiene Styrene (ABS)	~80°C	😊	😊	😞	😊	Chopsticks, spoons, forks

Sources of information: The Society of the Plastics Industry, Plastics New Zealand, The Japan Plastics Industry Federation, British Plastics Federation, PlasticsEurope, American Chemistry Council and product specifications provided by manufacturers. Properties of food contact articles made of each plastic material may vary due to differences in their formula and processing methods.

What is the safety issue of plastic food packaging and containers?

Chemicals that are used in the manufacture of plastics may migrate into food during use. Whether a chemical would pose health risk to consumers depends on its toxicity and amount of the chemical migrated into the foodstuff. As such, only plastic materials that comply with safety standards can be used for food contact. Plastic materials are particularly sensitive to the fat content and temperature of food. Many of the components in plastics are oil soluble, and plastics have relatively low heat resistance compared to other materials such as metals and ceramics.



It is said that some plastics contain "environmental hormones", what are they?

The so-called "environmental hormones" in plastics are endocrine disruptors either coming from the building blocks (monomers) or from the additives in plastics. They are hormone-like substances that can cause adverse health effects in humans or animals. The most concerned potential endocrine disruptors in plastics among consumers are bisphenol A and phthalates from plastic packaging and containers. Bisphenol A is a monomer used in the production of PC and epoxy resins (materials that can be used



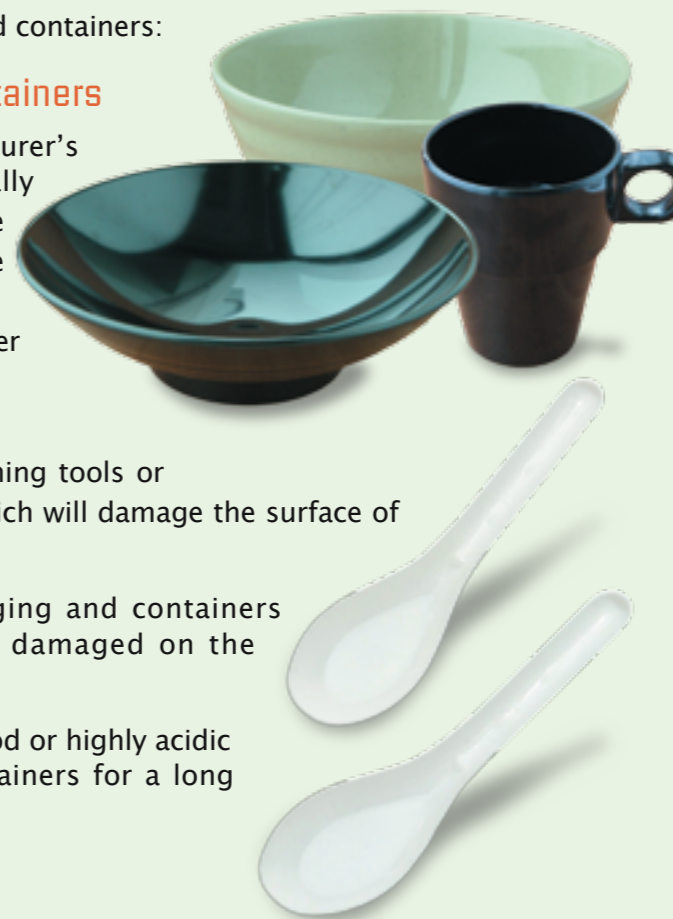
as a protective coating in food cans) while phthalates are additives that can be used as plasticisers in PVC. However, current scientific data show that the proper use of plastics will have very low levels of chemical migration, and unlikely to pose any health risks to consumers.

Can I reduce the migration of chemicals from plastic into food?

YES! Proper use of plastic packaging lowers chemical migration. The following are some tips for safe use of plastic packaging and containers:

Tableware and containers

- Follow the manufacturer's instructions especially on the temperature limitations, and the instructions on microwave and freezer uses.
- Do not use abrasive detergents and cleaning tools or strong chemicals which will damage the surface of tableware.
- Avoid using packaging and containers that are broken or damaged on the surface.
- Avoid storing oily food or highly acidic food in plastic containers for a long period of time.



Cling films and food bags

- Do not use cling films where they may melt into the food, such as in conventional ovens or with pots and pans on cooker hobs.
- When heating food in a microwave oven, ensure that the cling film does not touch the food. Only use cling films and food bags in contact with high fat foods when the manufacturer's advice states they are suitable for this. Examples of high fat foods include some types of cheese, raw meats with a layer of fat, fried foods, pastry products, and cakes or chocolates.



- Do not heat food in supermarket food bags.

Canned food

- Avoid food or drink from dented food cans.
- Remove food from the can before heating. Do not re-use empty cans for cooking. Leftover food should be placed in a sealable container that can be stored in the fridge or freezer.

Re-using plastic packaging

- Re-use packaging and containers on a like-to-like basis. For example, if a bottle was originally filled with water, do not put other liquids and beverages in it when re-used, as the acidity, fat or alcohol contents of other liquids and beverages may lead to more chemicals migrating from the plastic into the drink than would occur with water.

安全使用 塑膠類食物包裝和容器 認識多一點

Know More about the Safe Use of Plastic Food Packaging and Containers



- 避免使用破裂或表面破損的包裝和容器。
- 避免以塑膠容器長時間貯存油膩或強酸食物。

保鮮紙和食物袋

- 在可能溶掉的情況下(例如焗爐或置於煮食爐上的煲和平底鍋)，切勿使用保鮮紙。
- 以微波爐加熱食物時，確保保鮮紙不會接觸到食物。除非製造商另有說明，否則保鮮紙和食物袋不可用作接觸高脂食物。高脂食物，包括某些種類的芝士、帶有一層脂肪的生肉、煎炸食物、酥皮糕點、蛋糕或朱古力。

- 切勿將食物放在超級市場的食物袋內加熱。

罐頭食物

- 避免食用破損罐頭的食物或飲品。
- 把食物從罐頭取出後才加熱。切勿再用空罐來煮食。吃不完的食物應放在可貯存於雪櫃或冷藏格的密封容器內。



再用塑膠包裝

- 再用包裝和容器應以「類似原來用途」為原則。舉例說，膠瓶在購買時是載水的話，再用時不要用作盛載其他液體或飲料，因為其他液體或飲料的酸度、脂肪或酒精含量可能比水更容易令塑膠的化學物遷移至飲品。

塑膠的食物包裝和容器有何安全問題？

用以製造塑膠的化學物可能會在使用期間遷移至食物。至於有關化學物會否對人體健康帶來風險，則視乎其毒性和遷移至食物的分量而定。因此，只有符合安全標準的塑膠物料才可作與食物接觸的用途。由於不少塑膠成分均屬油性，而且塑膠的耐熱性也較金屬和瓷器等其他物料差，塑膠物料特別容易受到食物的脂肪和溫度影響。

一些塑膠被指含有“環境激素”，這究竟是什麼？

塑膠含有所謂的“環境激素”，是指來自塑膠構件(單體)或添加劑的內分泌干擾物。這些類似激素的物質有可能對人體或動物的健康造成不良影響。塑膠中最高為消費者關注的內分泌干擾物是塑膠包裝和容器所含的雙酚A和鄰苯二甲酸酯。雙酚A是生產聚碳酸酯和環氧樹脂(可用作罐頭塗層的物料)的單體，鄰苯二甲酸酯則是添加劑，可作為聚氯乙烯的塑化劑。不過，現有的科學資料指如果正確使用塑膠，化學物遷移量是微不足道的，不會對消費者的健康構成風險。

可否減少塑膠的化學物遷移至食物？

可以！正確使用塑膠包裝就能減少化學物的遷移。有關安全使用塑膠包裝和容器的提示載述如下：

餐具和容器

- 使用塑膠食物容器時，應遵從製造商的指示，特別是有關溫度上限和在微波爐和冷藏格使用的指示。
- 切勿使用含砂質的清潔劑、可刮花餐具的清潔用具或強力化學物，以免損毀餐具表面。



塑膠材料編碼和最常見塑膠的特性

標誌	塑膠種類	耐熱程度	耐酸程度	耐鹼程度	耐醇程度	耐油程度	常見的食物接觸產品例子
	聚對苯二甲酸乙二醇酯 (PET / PETE)	~攝氏80度	☺	☺	☺	☺	用後即棄飲料瓶、油瓶
	高密度聚乙烯 (HDPE)	~攝氏75度	☺	☺	☺	☺	奶類飲料瓶、酸乳酪飲料瓶
	聚氯乙烯 (PVC / V)	~攝氏80度	☺	☺	☺	☺	玻璃瓶的金屬蓋墊片、商用保鮮紙、手套
	低密度聚乙烯 (LDPE)	~攝氏70度	☺	☺	☺	☺	保鮮紙、食物袋
	聚丙烯 (PP)	~攝氏140度	☺	☺	☺	☺	適合於微波爐用的容器、可再用的餐具
	聚苯乙烯 (PS)	~攝氏95度	☺	☺	☹	☹	用後即棄外賣容器和餐具、酸乳酪容器
	其他	視乎塑膠或合成塑膠而定					
	聚碳酸酯 (PC)	~攝氏140度	☺	☹	☺	☺	可再用飲料瓶
	三聚氰胺甲醛樹脂 (MF)	~攝氏120度	☺	☺	☺	☺	餐具
	丙烯腈-丁二烯-苯乙烯 (ABS)	~攝氏80度	☺	☺	☹	☺	筷子、匙、叉

資料來源：塑膠工業協會、新西蘭塑膠業協會、日本塑料工業聯盟、英國塑膠業協會、PlasticsEurope、American Chemistry Council和製造商提供的產品規格。以每種塑膠物料製成的食物接觸物品的特性或會因配方和加工方法不同而有差異。

塑膠物料廣泛用於食物包裝和容器。最近，市面出現越來越多各式各樣的塑膠物料。由於相關研究和資料日益增加，消費者或會關注塑膠物料的安全性。了解不同塑膠物料的特性，有助消費者安全地使用塑膠包裝和容器。

塑膠是什麼？

塑膠是指一大群以聚合物作為基本物質組成的物料，而聚合物則由許多單體的重複單位構成。此外，為改進塑膠的性能和使其容易加工，還可添加塑化劑(增塑劑)、增韌劑和發泡劑等其他添加劑。

哪些塑膠物料通常用於食物包裝和容器？

最經常用於食物包裝和容器的塑膠物料包括聚對苯二甲酸乙二醇酯(PET或PETE)、高密度聚乙烯(HDPE)、聚氯乙烯(PVC或V)、低密度聚乙烯(LDPE)、聚丙烯(PP)、聚苯乙烯(PS)和聚碳酸酯(PC)。

如何識別不同類別的塑膠物料？

可從塑膠材料編碼識別所使用的塑膠物料。有關編碼或可在包裝或容器上找到。最常用於包裝的塑膠物料類別會根據塑膠材料編碼以一個數字代表，印於以箭咀組成的三角形標誌內，而英文簡稱則印於三角形標誌之下(見表)。編碼是由美國塑膠工業協會(Society of the Plastics Industry)創立，以方便塑膠的回收再造。

