MANUFACTURERS REPRESENTATIVES

"Connecting Partnerships"

FOODSERVICE DISPOSABLES ENVIRONMENTAL PRODUCT GUIDE

8th Edition 2024

NEXUS CORPORATE HEADQUARTERS

7042 Commerce Circle, Suite B Pleasanton, CA 94588 | T 800.482.6088 | F 510.567.1005

www.nexus-now.com

rev. 1/24

The information provided in this guide may vary in accuracy due to the ever changing city, state and federal rules, regulations, ordinances and laws that govern recycling, landfills and commercial compost facilities.

MISSION STATEMENT OF THIS PUBLICATION

"Our mission, as manufacturer's representatives, is to strive to be good stewards to the environment in our marketplaces by educating, training and informing our customers on all of the different packaging materials and substrates that are used to make a wide array of disposable foodservice products. In this publication we also seek to advise our customers on how each packaging substrate should be used in operational applications like microwaves, freezers and ovens as well as which materials can be recycled and or composted in each respective region in the Western United States."

Chris Matson
President, Nexus

FOODSERVICE DISPOSABLES
ENVIRONMENTAL PRODUCT GUIDE

"Connecting Partnerships"

TABLE OF CONTENTS

INTRODUCTION

The world of foodservice packaging disposables can be very confusing in today's ever changing marketplace. There are so many different packaging materials that are used in a variety of food applications made by hundreds of manufacturers. Materials like PET, CPET, RPET, PLA, CPLA, PP, OPS, EPS, PVC, HDPE, GPPS, LLDPE, Aluminum, Paper, Wood, Paperboard, Corrugated Board, Bamboo, Bagasse, Glass, Molded Fiber and even Wheat Straw Grass. This guide will clarify how to use all of these different packaging substrates in a multitude of foodservice operational applications. In addition to the wide variety of packaging material options, there are cities across the North America that have banned select grades of plastics and have created new waste collection channels that lead away from landfills and to recycling centers as well as to commercial compost facilities. These new municipal changes can be confusing for many foodservice operations and even consumers. As a result this guide is intended to provide a general understanding of the substrates themselves as well as the ever changing impact that packaging has on our environment. The guide also covers how waste is being managed by the recycling centers and composters and even other countries. Our goal is to provide the right information so that you can make the best decision with your food packaging options for your business and also guide you in how you can help the path of your packaging's true end of life destination.

Written by : Chris Matson

RESTAURANT TAKEOUT PACKAGING

COVID-19 put a spotlight on takeout packaging and this time it was a good thing. Just before COVID-19 impacted the U.S. there were many cities around the country that were about to ban plastic bags, plastic containers, plastic straws and in some cities a ban on all disposables was about to be voted on. COVID-19 is a reminder to us all that bacteria and germs can have a devastating impact on our health and on our economy in so many ways. The Spanish Flu impacted the U.S. back in 1918 and killed 675,000 Americans. What city administrators do not seem to understand is their history which is a disposable paper cup was invented in 1918, during the Spanish Flu, so that people did not share reusable cups at company water fountains. Disposable cups are thrown away or even recycled. Reusable cups and dinnerware and even reusable containers are popular in a lot of green cities because they want to eradicate disposables from their trash and landfill. However, what they do not understand is that they are setting themselves up for another COVID-19 germ that can be passed on through reusable foodservice ware. That is why disposable food packaging has been so popular over the last 100 years because it prevents the spread of germs and bacteria.

These days, most Americans think nothing of picking up dinner, bringing it home and enjoying all the benefits of a meal in, without the hassle of dishes, cooking and clean up. But not that long ago, takeout as we know it was unheard of. While restaurants have flourished in America since colonial times, takeout (and its twin sister, delivery service) originated in the 1920s, in (no surprises here) Los Angeles, California. An enterprising Chinese restaurant owner placed an ad for his new business, proudly proclaiming that the Kin-Chu Café was "the only place on the West Coast making and delivering real Chinese dishes." And while Chinese food is still the number one takeout and delivery food in the United States, it's now possible to get fresh sushi, Indian curries and all-American hamburgers at your kitchen table in about as much time as it takes to drive to the corner store.

As it happened, that forward-thinking Los Angeles entrepreneur was a bit ahead of his time. Thanks to the penny-pinching influences of the deepening Great Depression, the Dust Bowl and then World War II, takeout did not take off the way it could have until the 1950s. By then, lifestyle changes and advances in packaging technology led to a takeout boom alongside the baby boom. World War II GIs moved their families to the suburbs, where they had TVs to watch, yards to tend and things to do other than slave over a stove. It is no accident that takeout became popular alongside cake mixes, TV dinners and other convenience foods. The first mention of delivery service was none other than – you guessed it – a pizza place, once again in Los Angeles, in 1952. Casa D'Amore promised free delivery if you made the minimum order of $2.50. Back when a medium combo pizza was $2.25, it was not that hard to do!

Thanks to our increasingly busy lives, takeout and delivery have exploded in popularity over the past decades. Now we do not even have to leave our computers to summon our food to us after a long day at work. The one item most associated with takeout is the thing that is changed the least over the years. The wire-handled white paper bucket used to bring you everything from chow mein to spaghetti to fried chicken is over 100 years old. That little bucket is called an "oyster pail" in the industry. It was invented to hold oysters, back when the bivalve was a cheap and plentiful food sold by street peddlers throughout the country. Shucking oysters, even back then, was a dangerous task, so housewives would purchase pre-shucked oysters from a vendor, who would slip them into the container to be cooked at home later. The technology had barely changed when, sometime in the 1970s, a graphic designer put a pagoda on the side of the pail and a faux-Asian "Thank You" on top. From then on, the containers became an indelible fixture of the Chinese takeout industry, even though they have never been used in China.

In any given day in the United States, 6% of the entire country will be eating take-out for one meal or another. Whether it is ordered with a touch on an app, a few clicks on a website or a quick phone call to the neighborhood pizza joint, delivery food can seem like just another modern convenience. But a jaunt through culinary history quickly reveals that there is nothing new about the concept of take-out. In fact, for as long as there have been advanced societies, humans have been buying food to go.

THE TAKE-OUT CLASS

Until the middle of the 20th century, the most common places to find take-out were major transit hubs, like train stations or the intersections of well-traveled highways. Finding fully cooked meals to go in these locales was not only typical in the United States, but a common practice across the globe as well; American soldiers traveling in the Far East in the late 19th and early 20th centuries often wrote of the "little lunches put up in flat boxes" they purchased on trains in Japan and China. Though servant-delivered restaurant dishes were the province of the wealthy, this kind of eating on the go was more likely to be part of a laborer's life.

DRIVING DELIVERY

After the Second World War, the concept of delivery took off across a broader swath of the restaurant world. By the early 1950s, the bourgeoning American middle class had purchased second cars, moved to the suburbs and discovered the primal joys of television. As families increasingly spent their leisure time in their own homes glued to the boob tube, restaurants saw their profits steadily declining. With an "if you can't beat 'me" attitude, restaurant associations quickly declared "the take-home trade has come as a solution to the problem" and restaurants throughout the country began advertising television menus made for taking home. Those eating-houses that started offering their customers that service in the early 1950s "showed sales increases of 20% to 50%" in a single year. By the end of the decade, menus regularly contained reminders that "Any Item …May Be Ordered to Take Out," which meant that restaurant food at home was no longer just for rich people or just for those without any other option. In the postwar years, take-out and delivery became something for everyone.

Amongst the most popular items on these "television menus" was, unsurprisingly, the pizza. In the 1940s soldiers returning from the War in Europe had developed a taste for Italian cuisine and flocked to dine in the Italian restaurants that had dotted American cities since the first major waves of Italian immigration in the early 20th century. Hungry civilians were intrigued and even the New York Times took it upon itself to explain that this newly popular "pizza" was "a pie made from a yeast dough and filled with any number of different centers, each one containing tomatoes." By 1944, restaurants in New York City offered pizza that could be "ordered to take home," which were "packed, piping hot, in special boxes for that purpose." A few years later, Los Angeles would again prove to be on top of the world's delivery needs, when a pizza joint named Casa D'Amore began offering what is thought to be one of the first examples of free delivery. (This was, of course, only if eaters met the $2.50 minimum order.) These days, one in eight American adults will eat pizza on any given day, be it a frozen pie or brought to their homes by their friendly, neighborhood delivery boy.

After solving the television problem, take-out and delivery only continued to evolve. By the 1960s, private automobiles had taken over American roads and fast-food joints catering almost exclusively in food to-go became the fastest growing facet of the restaurant industry. By the 1990s the internet started to made its mark on American take-away and as early as 1997, entrepreneurs who felt that "the internet and on-line communications are here to stay" starting putting up "websites for menus" where hungry eaters could order their favorite foods online.

And delivery is taking on newer and more convenient forms in today's ever-changing technological landscape. There is of course the model championed by industry giant Seamless, which allows users to order food delivery with the touch of an app, but supermarkets like Whole Foods and Tesco will also now deliver groceries straight to one's door while companies like Blue Apron will send hungry shoppers ready-to-cook meals. In recent years, the food delivery space has become one of the biggest and most lucrative in the tech world; in 2014, venture capitalists invested over $1 billion in the field, knowing full well that humans of whatever century will always be hungry—and will always be looking for a quick and convenient bite to eat.

TAKEOUT PACKAGING

As mentioned above the first takeout container was a paperboard laminated Chinese food pail. Over time restaurants needed a variety of different types of takeout packaging to utilize for their soups, steaks, pastas, salad dressings, gravies and desserts. After WW II ended the age of plastics evolved and manufacturers began popping up all over the country to fill this new demand. Hungry families now living out in the suburbs in the 1940's and 50's wanted takeout at least twice a week from their favorite local restaurant.

The first series of containers that were used were made from aluminum foil. The foil square, round and rectangular containers were great heat insulators and could be put back in the oven to warm up as well.

Over time expanded polystyrene (EPS Foam) and oriented polystyrene food packaging began to evolve for bakeries, supermarkets and especially for restaurant takeout applications. In the 1970's and 80's newer plastic substrates began to emerge like polypropylene and high-density polyethylene food containers.

In the 1990's a new and stronger resin called PET or polyethylene terephthalate (water bottle plastic) was invented and is used among hundreds of plastic packaging companies today. The reason PET is so popular is because it is crystal clear, it is very strong in its chemistry makeup and it can be extruded and thermoformed into a variety of shapes and sizes.

In the late 1980's and throughout the 1990's paperboard began to emerge as a substrate that could be used for food packaging. Paper mill companies began treating and laminating paperboard to be converted into clamshells, cake boxes, lunch boxes, deli food containers and especially hot and cold cups.

In the early 2000's scientists figured out a way to make resin out of the sucrose found in plant starches. Since the U.S. has an abundance of corn food packaging companies began buy a new resin invented by Nature Works called "PLA" or polylactic acid. PLA is corn starch that has been scientifically manipulated into a resin that can be thermoformed into food packaging.

In the mid 2000's manufacturers overseas especially in Taiwan and in China began grinding up sugar cane reed stock into a pulp called bagasse. They put the pulp into a boiler pool and then pushed out the water against a screen to form a plate. This process is called molded fiber. Domestically here in the U.S. it is also done with recycled newspaper and paperboard. Molded fiber can be molded into a variety of clamshells, bowls and plates and can be made with any type of fiber that can be ground into a mush to be formed. There are manufacturers today that use bagasse, bamboo, recycled paper and the newest substrate used also here domestically in the U.S. is wheat grass.

In summary Restaurant Takeout Packaging started a long time ago …..a paper cup was invented to stop the spread of germs during the Spanish Flu in 1918. Then in Southern California it was a Chinese Restaurant who started using a paper pagoda food pail for takeout that triggered a rise in demand for a multitude of other different types of foodservice packaging disposables that created a trillion dollar industry globally. New substrates like aluminum, polystyrene, polypropylene, polyethylene terephthalate, and bagasse and polylactic acid. City Administrators are trying to ban a variety of different types of plastic disposables but I think COVID-19 is a glaring example and reminder why foodservice takeout packaging should remain and allow all of us the germ free safety we have enjoyed for 100 years.

SOURCES: STEPHANIE BUTLER HISTORY CHANNEL, Emelyn Rude – Time Magazine

RESTAURANT TAKEOUT PACKAGING CONSIDERATIONS

As already described in this chapter so far there are countless options when it comes to restaurant takeout packaging. As a result, foodservice managers typically have to give some consideration to these key questions before they make a final decision on what their lineup of takeout packaging might be for their operation. These key questions below can lead to a much broader conversation which is when a Rep Agency like Nexus can provide valuable information, samples and guidance to a restaurant manager, owner or chef.

Questions like:

1. **MENU** – Which portion of the in-house dinning menu will also be offered on the to-go menu? All of the entrees, sides and deserts or select items only?
2. **FOOD INGREDIENTS** – What type of food ingredients are going to be challenging to pack up for a to-go order? Food items like soup, or chili, or ice cream.
3. **PORTION SIZE** – What portion sizes need to be packed up?
4. **MICROWAVE** – Does the entrée or side being packed up potentially need to be re-heated when the customer gets home?
5. **OVEN** – Does the entrée or side being packed up potentially need to be baked or roasted in an oven when the customer gets home?
6. **INTERACTION** – How will the packaging perhaps change the taste of our food? Example, not venting a lid will make French fries soggy. Or the lack of insulation around a key ingredient in an entrée may also change the taste.
7. **REFRIGERATION** – Do we need takeout packaging that the customer can securely store in a refrigerator without any issues with the packaging? Example, can the lid to the container be sealed and locked back onto the container to sustain freshness?
8. **PACKAGING ORDINANCES** – What local city, county or state ordinances do we need to be aware of before we choose our lineup of takeout packaging?
9. **UTENSILS / PLATES** – What type of utensils like a fork, spoon, soup spoon or knife do we want to provide our customers? How do we manage the quantity of napkins placed inside of the to-go bag?
10. **FUNCTIONALITY** –Does packaging need to be leak tight? Do the lids need to be able to vent steam out? Do we need compartmented containers to separate sauces? Do the containers and lids need to be able to stack?
11. **SUSTAINABILITY** – If the local city, county or even state ordinances require that you use compostable takeout packaging then which style of GREEN takeout packaging is most functional for our needs?
12. **BUDGET** – What is the restaurant's budget for takeout packaging (cost per unit) that fits within the performance and functionality of our menu needs?
13. **BRANDING** – A logoed takeout container, bag, cup or lid is a walking advertisement for the restaurant. Is this extra cost worth it? What are the options for branding takeout packaging, the minimum run requirements and what is the cost?
14. **MARKETING** – How can we utilize our lineup of takeout packaging to help stir repeat business? Can we add a coupon, a QR code or perhaps a promotional peelable label to our takeout packaging to entice customers to come back?
15. **RECYCLING** – What is the end of life channel for our takeout packaging? Is it recyclable, compostable or does it go into landfill?
16. **DISTRIBUTION** – How can we buy the lineup of takeout packaging? Which local distributors stock the packaging we need?






FOOD PACKAGING TRENDS

In the last chapter of this guide the history of restaurant takeout packaging was covered as well as all of the different types of disposable packaging substrates. In this chapter Food Packaging Trends will be explained and this chapter discusses why these trends have come and gone over the years.

In the 1960's and 70's food packaging was very basic with only aluminum, foam and paper really being the only options. Some grocery stores and even restaurants did not offer a to go program at all. The aluminum TV dinner tray was still a big hit invented in the early 1950's.

In the 1980's plastics really began to emerge with polystyrene and an expanded role of foam or expanded polystyrene offering a lot of packaging options.

In the 1990's new food packaging trends began to emerge that changed the way consumers viewed food and it's portability. The age of PP (polypropylene) and PET (Polyethylene) gave grocery deli managers and restaurant chefs a variety of styles, shapes and colors to use for to-go packaging. Paperboard, in it's many forms, also began to emerge as a popular choice in that it could be printed, folded, laminated and used in a variety of food applications.

HOME MEAL REPLACEMENT

In the late 1990's soccer moms and dads needed a quick and healthy large pre-packed meal to pick up somewhere to feed their families. Grocery stores and even Club Stores began prepacking food into aluminum foil containers (because they are safe for the oven) and plastics manufacturers introduced CPET (crystallized polyethylene terathalate) which is a plastic that can go into the oven up to 400 F. HMR as it is now known is still even relevant and common today but the packaging has changed in so many ways.

ECO-GREEN PACKAGING

In the early 2000's Eco-Green packaging became popular. When you think about it eco-green style disposable food packaging has been around since the very beginning with Chinese food pails, paperboard French fry trays and cake boxes as well as corrugated paper pizza boxes all of which from the very start were and still are 100% recyclable and compostable. In the late 1970's plastics began replacing aluminum, paper and glass packaging as a cost-effective substrate to use to manufacturer disposable food packaging. It was not until around 2005 that the word "Green" was being applied to disposable food packaging with the advent of plant-based starch packaging and molded fiber containers. Due to global warming, the debris found in the oceans and waterways and because only a few plastics are actively recycled and used again in some form consumers began asking for more sustainable packaging that can be either recycled or composted. When a plastic straw was removed from a sea turtles nose, in 2015 on social media, it went viral and soon after plastics had a bad wrap and cities and county municipal governments began banning a variety of different grades of plastic like EPS (Foam), HDPE (plastic bags) and PP (Plastic straws). The state of California went as far as to make it a mandate to reduce, reuse, rot or recycle (The four R's) and even set forth a Zero Waste initiative that would eliminate all waste into California landfills by the year 2040. As a result Eco-Green approved disposable packaging sales sky rocketed and the age of Green was born. There are now hundreds of different manufacturers, importers and converters of a multitude of different green substrates that now market their products into the food industry.

A 2015 Nielson Global Corporate Sustainability Report found that 66 % of consumers and 73% of millennials are willing to spend more on a product if it comes from a sustainable brand. This surge in consumer demand for sustainable products is impacting the food industry.

Foodservice operators can purchase Green to-go packaging in all shapes and sizes like:

- Sandwich Wrap
- Box Packaging
- Windowed Bags
- Salad Boxes
- Wrap Pack Boxes
- Hot Food Boxes
- Cups & Lids
- Containers & Lids
- Natural Collection
- Cutlery utensils
- Compostable straws
- Gastro Collection
- Street Food Range

TAMPER-RESISTANT PACKAGING

Especially in instances of catering or food delivery, customers want to know now more than ever that the food they purchased hasn't been tampered with. SecureIt™ labels are tamper-resistant for to-go packaging that helps keep your food safe and untouched. Having a tamper-resistant label on

the product gives peace of mind to the consumer.

And with customizable packaging and branding options, you can engage your customers in new and exciting ways, making your to-go packaging an extension of the restaurant dining experience.

FOOD ON DEMAND

The days of limited delivery options like pizza and Chinese food are long gone. With smartphone apps like GrubHub, UberEats, and Doordash, customers can get their favorite restaurant items delivered right to their front door. From steak and hamburgers, to pasta and salad, and sushi and tikka masala, nothing is off limits in the food delivery world. This trend is only going to continue growing. According to investment bank UBS, the food delivery service will continue to rise, predicting an annual average increase of 20% to $365 billion worldwide by the year 2030. To keep up with demand, restaurants must prioritize their to-go and catering packaging to ensure customers receive hot, fresh and safe meals.

DIGITAL PRINTED PACKAGING

Digital printing refers to a method of printing where the image is digital-based and then applied directly to the product. Digital printing allows brands much more flexibility on branding and design than manual typesetting. It is a much less time consuming method than offset printing which requires setup and plates. Most packaging companies have already switched to digital printing within the last decade. According to a market research study done by LPC, "new digital press installations in North America are growing at 11.9% per year while conventional press installations are contracting at an annual rate of 8-9%." If you haven't switched to digital printing for your packaging, contact print experts for a free quote or consultation. In the food industry, the packaging is as important as the contents themselves. Food packaging markets the product, prolongs its shelf life, and facilitates long-distance transportation. Being aware of the latest food packaging trends can help you keep your A-game on with your packaging selection.

TECHNOLOGY ENABLED PACKAGING

Smart packaging is a clever way to package products. Technology can now be embedded right into the packaging to provide the consumer with more convenience, security, and information. Food packaging comes embedded with NFC chips or printed QR codes, Smart Labels that can be scanned using a smartphone to provide more information about the product.

Smart packaging also tracks several parameters like pH, temperature, fermentation to ensure freshness, flavour, quality, and maintain compliance with health standards. For example, Maggi Healthy Soups by Nestlé uses their patented 'granulation-based technology' to retain the freshness of key ingredients.

Technology-enabled packaging can be used to add cosmetic appeal too. For instance, during the FIFA 2018 World Cup in Russia, Budweiser provided beer cups with embedded LED lights. The lights were activated by noise. The more one cheered for their team, the more lights glowed.

Frito-Lay's pack of tortilla-chip, Tostitos, came with an alcohol sensor, LED lights and NFC chips at the 2017 Super Bowl. The goal was to call an Uber ride for those who got drunk, adding a different dimension to packaging for consumer safety.

EMOTIONAL ENGAGEMENT STYLED PACKAGING

Consumers want more than just a product. They want to be part of a story. Studies have revealed that people are impacted by emotions, rather than information when making brand decisions. Emotional content is popular in advertising, social media, and consumers, with positive sentiments leading the way.

Take for example the case of Paper Boat. Paper Boat has successfully incorporated the feeling of reminiscence in its packaging to add emotional appeal. Their tagline, advertising, to graphics on the pouch captured a particular period in time perfectly.

VINTAGE STYLES OF PACKAGING

Vintage designs have a nostalgic value. They evoke happy feelings in people reminding them of simpler times. The term "vintage" refers to any design or hint of a time gone by. This could be a single era or a combination of eras. Such designs trigger emotions that go beyond appealing to people who've lived in that era. They appeal to millennials too, who probably never experienced that time period.

Image courtesy Food Business News

The packaging for Van Leeuwen ice creams, Jack Daniel's whiskey, or even the Parle-G biscuit are classic examples of how elements— graphics, letterpress fonts, solid matte or pastel colors— from the 1950s or 1960s can be incorporated into the design.

TRANSPARENT CLEAR PACKAGING

As per the research on Packaging and Consumer Behavior in 2020, "38% of consumers are willing to purchase a newly launched product with clear product information".

People are conscious of what they eat. Although food packaging contains information on ingredients, reading the fine print can be hard. Companies are adopting transparent packaging and clear labelling to list out the contents of the product. Healthy food delivery arm Eat.fit underwent a packaging overhaul to clearly indicate the contents of each box. And, to stick to its promise of delivering healthy packaged meals daily. Clean labelling can help you upscale your brand identity and assist consumers in making a knowledgeable purchase.

INCREASED PORTABILITY AND FUNCTIONALITY

Most consumers have an 'on-the-go' lifestyle. This means they're constantly looking for food options that are easier to grab, hold, eat, or carry. To meet this need, brands are putting in extra effort into making food packaging portable. McDonald's, for example, launched the McBike package, especially for cyclists. The pack allows you to carry a burger, fries, and a drink in a foldable case that can be hooked to the handlebar.

Image Courtesy: GenHERation

Dunkin Donuts has a coffee cup top that is molded to carry condiments— sugar, cream, or coffee. Similarly, VitaPack offers paper-based packaging that lets you carry 1kg of fruit without much effort.

PERSONALIZATION

Personalization has been a crucial part of food packaging and is one of the leading trends. According to Deloitte Consumer Review, over 50% of millennials and Gen Z express a desire for personalized products. With the increase in production speeds, food packaging personalization is a reality. Take, for example, Coca-Cola. After the soda giant successfully launched bottles printed with names, personalized gift orders on their online store experienced a massive boost in sales. Although the personalized food packaging trend is yet to be affordable to smaller food businesses, there are options to customize packaging. Manual customization can include the use of customized bags, boxes, stickers, or even gift tags to increase brand recall and appeal.

MINIMALISM

Minimalism is a huge trend in packaging design. The packaging industry has drifted away from flamboyant typefaces and cluttered designs, to adopt simplistic, clear labelling and packaging.

Minimalism is here to stay because of its no-nonsense nature. It helps highlight the product's value and does not overpower customers with graphics. This design trend is visible in almost every modern food packaging – be it snack bars, ketchup bottles, or even paper packaging for takeaway food at restaurants. Keeping the design simple not only makes the packaging look clean but also reduces the cost. Raw Pressery Juices is a good example of minimalistic beverage packaging.

GRADIENT COLORS

Consumer studies say, "70% of consumers find graphics, color, & shape the most attractive aspects of packaging". Gradients are a growing trend in multiple areas of design. Whether it's the logo or packaging, gradient adds a level of depth and complexity that adds intrigue. Unlike minimalistic or vintage packaging that uses solid or subdued hues, gradients can bring attention to the consumer's senses that may impact their behavior.

We now see the use of paper packaging more than ever. For example, plastic food trays are being replaced by biodegradable meal trays. A lot of research is also going into edible food packaging as well where the pack itself can be consumed as a part of the food. Multiple start-ups have also begun manufacturing single-use food packaging and cutlery from plant-based materials for improved sustainability.

The role of packaging in the consumer journey has really evolved and extended beyond the shelf to the club stores and to the restaurants. Emerging trends in the food packaging industry are highly influenced by the need for smart, clean, convenient, functional, portable, recyclable and even sustainable solutions.

NEED HELP UPDATING YOUR PACKAGING?

We have the solutions for you – simply call Nexus 1800-482-6088

SOURCES: Dotit.com and Bizongo.com











FOODSERVICE PACKAGING

HOT AND COLD CAPABILITIES

It's important to know that not every foodservice packaging material can withstand the environments of a refrigerator, an oven, a freezer and a microwave. The charts below will provide a clear understanding of each material's cold and hot foodservice operational capabilities.



FREEZER	YES	NO
POLYPROPYLENE		•
CPET	•	
POLY LAMINATED PAPERBOARD	•	
ORIENTED POLYSTYRENE		•
EXPANDED POLYSTYRENE (FOAM)		•
ALUMINUM FOIL	•	
PAPER	•	
POLYLACTIC ACID (PLA)		•
BAGASSE	•	
POLYETHYLENE TERATHYLATE (PET)		•
BAMBOO	•	

OVEN	YES	NO
POLYPROPYLENE		•
CPET	•	
POLY LAMINATED PAPERBOARD	•	
ORIENTED POLYSTYRENE		•
EXPANDED POLYSTYRENE (FOAM)		•
ALUMINUM FOIL	•	
PAPER		•
POLYLACTIC ACID (PLA)		•
BAGASSE		•
POLYETHYLENE TERATHYLATE (PET)		•
BAMBOO		•

MICROWAVE	YES	NO
POLYPROPYLENE	•	
CPET	•	
POLY LAMINATED PAPERBOARD	•	
ORIENTED POLYSTYRENE		•
EXPANDED POLYSTYRENE (FOAM)		•
ALUMINUM FOIL		•
PAPER	•	
POLYLACTIC ACID (PLA)		•
BAGASSE	•	
POLYETHYLENE TERATHYLATE (PET)		•
BAMBOO	•	

PLASTICS - TAKE OUT BAGS

The whole perception of restaurant and grocery takeout bags has certainly changed over the past few years and continues to do so as cities and states decide which types of materials are acceptable within their own waste and recycling streams. For example, in 2016 the state of California passed a new bill (Proposition 67) which banned the use of HDPE plastic t-shirt bags in all retail grocery and pharmaceutical stores. In some cities in California even restaurants are banned from using HDPE t-shirt bags for takeout. The reason is people just got tired of seeing 15 billion t-shirt bags either floating around on the freeway, or clogging up their waterways and, most importantly, being the number one contributor in all landfill waste. That being said, a plastic t-shirt bag is the least expensive option for retailers and is a very flexible and functional bag for carrying weight. As a result of this new legislation in California, other states are now taking notice and debating their own legislation in regards to which types of bags should be used and evaluating the overall carbon footprint of each style of carryout bag. For example, many think that paper is the ideal carryout bag because it's perceived seen as a green substrate. Ironically, paper mills are some of the most toxic and regulated plants in the country, due to the amount of waste that they purge out into the environment on a daily basis, not to mention all of the forests that are cut down to make paper bags. However, paper bags are compostable. Consumers, over the past 10 years, have really begun to voice their opinion through protests and new legislation that forces lawmakers to take to-go bags more seriously. The results of these consumer efforts have led to new types of bag materials, like non-woven nylon reusable bags made from recycled plastic, and thick 2.25 mil gauge HDPE wave bags that are made from recycled plastic that are also considered reusable. Even paper bags are now being made out of post consumer recycled pulp. The chart below provides you with a clearer understanding about each type of take-out bag and its material, as well as the pros and cons associated with each style. The below chart shows both the "Benefits" and the "Disadvantages" of all bag substrates.

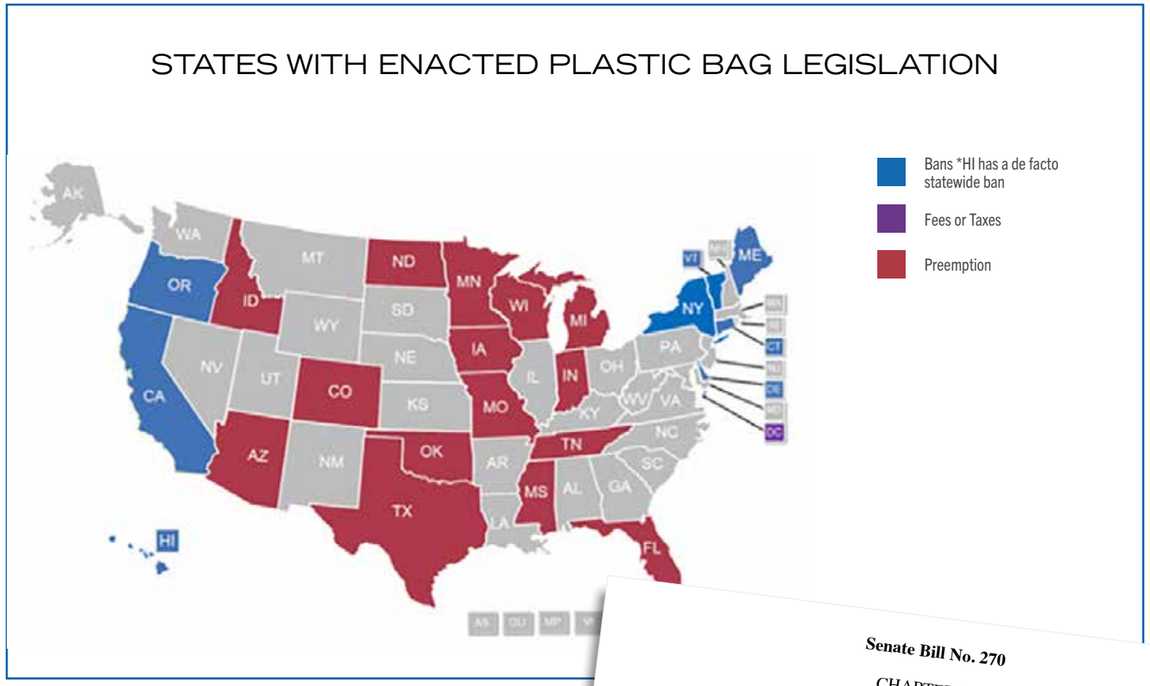
RESTAURANT AND GROCERY TAKEOUT BAG OPTIONS

BAG MATERIAL NAME	HDPE PLASTIC T-SACK		REUSEABLE 2.25 HDPE RECYCLED WAVETOP BAG		NYLON NON-WOVEN RECYCLED PLASTIC BAG		PAPER GROCERY BAG	
								
PROS & CONS	PRO	CON	PRO	CON	PRO	CON	PRO	CON
	• Least expensive • Highly functional • Small case cube • Flexible • Customizable	• Difficult to recycle • Clogs waterways • Bulk waste in landfills • Banned in some states	• Durable, strong • Reusable • Small case cube • Customizable • Made of recycled material	• Difficult to recycle • Medium carbon footprint • Expensive • Hard to clean	• Durable, strong • Reusable • Strap handles • Customizable • Made from recycled material	• Difficult to recycle • Large carbon footprint • Most expensive • Typically made overseas • Hard to clean	• Recyclable • Compostable, renewable • Customizable • Reusable • Made from recycled paper	• Rips easily • Size limitations • Large case cube • Not moisture proof • Large carbon footprint

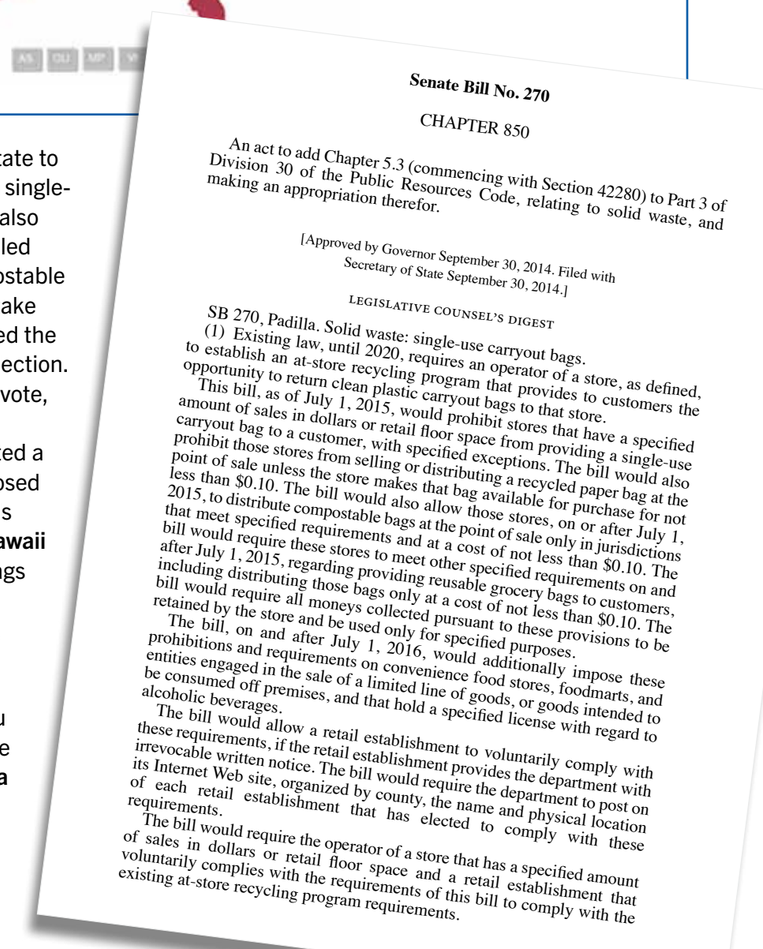
WHAT IS THE ENVIRONMENTAL IMPACT DIFFERENCE BETWEEN PLASTIC AND PAPER BAGS?

- 2,000 plastic bags weigh 30 lbs., whereas 2,000 paper bags (in an equivalent size) weigh 280 lbs. (Source: EPA). This means that it would take at least nine more truckloads of paper bags to deliver the same amount of plastic bags.
- Paper bags produce 85% more green house gas emmissions and 91% more energy to recycle than plastic bags (U.S. EPA).
- 1,004 gallons of water waste is needed to produce 1,000 paper bags and it takes zero percent water waste to produce plastic bags.

WESTERN U.S. PLASTIC BAG BAN ORDINANCES



In August 2014, **California** became the first state to enact legislation imposing a statewide ban on single-use plastic bags at large retail stores. The bill also required a 10-cent minimum charge for recycled paper bags, reusable plastic bags, and compostable bags at certain locations. The ban was set to take effect on July 1, 2015, but a referendum forced the issue onto the ballot in the November 2016 election. Proposition 67 passed with 52 percent of the vote, meaning the plastic bag ban approved by the Legislature remains the law. Voters also rejected a second measure, Proposition 65, which proposed to create an environmental fund with proceeds from a 10-cent charge for alternative bags. **Hawaii** has a de facto statewide ban on all plasstic bags and prohibits non-biodegradable plastic bags at checkout, as well as paper bags containing less than 40 percent recycled material. Bans in Kauai, Maui and Hawaii counties took effect between 2011 and 2013, with Honolulu becoming the last major county to approve the ban in 2015. In 2009, the **District of Columbia** enacted legislation requiring all businesses that sell food or alcohol to charge 5 cents for each carryout paper or plastic bag.



Senate Bill No. 270

CHAPTER 850

An act to add Chapter 5.3 (commencing with Section 42280) to Part 3 of Division 30 of the Public Resources Code, relating to solid waste, and making an appropriation therefor.

[Approved by Governor September 30, 2014. Filed with Secretary of State September 30, 2014.]

LEGISLATIVE COUNSEL'S DIGEST

SB 270, Padilla. Solid waste: single-use carryout bags.

(1) Existing law, until 2020, requires an operator of a store, as defined, to establish an at-store recycling program that provides to customers the opportunity to return clean plastic carryout bags to that store.

This bill, as of July 1, 2015, would prohibit stores that have a specified amount of sales in dollars or retail floor space from providing a single-use carryout bag to a customer, with specified exceptions. The bill would also prohibit those stores from selling or distributing a recycled paper bag at the point of sale unless the store makes that bag available for purchase for not less than $0.10. The bill would also allow those stores, on or after July 1, 2015, to distribute compostable bags at the point of sale only in jurisdictions that meet specified requirements and at a cost of not less than $0.10. The bill would require these stores to meet other specified requirements on and after July 1, 2015, regarding providing reusable grocery bags to customers, including distributing those bags only at a cost of not less than $0.10. The bill would require all moneys collected pursuant to these provisions to be retained by the store and be used only for specified purposes.

The bill, on and after July 1, 2016, would additionally impose these prohibitions and requirements on convenience food stores, foodmarts, and entities engaged in the sale of a limited line of goods, or goods intended to be consumed off premises, and that hold a specified license with regard to alcoholic beverages.

The bill would allow a retail establishment to voluntarily comply with these requirements, if the retail establishment provides the department with irrevocable written notice. The bill would require the department to post on its Internet Web site, organized by county, the name and physical location of each retail establishment that has elected to comply with these requirements.

The bill would require the operator of a store that has a specified amount of sales in dollars or retail floor space and a retail establishment that voluntarily complies with the requirements of this bill to comply with the existing at-store recycling program requirements.

IS PLASTIC REALLY THAT BAD?

PERHAPS ARE GOVERNMENT LEGISLATORS ARE MISINFORMED?

As you read through this environmental guide it is important to know that it is the opinion of the author of this book that plastic is not bad. What is bad is the misinformation being relayed to the government officials who feel compelled to pass ordinances and laws that prohibit the use of single use plastics in foodservice operations. In addition, what is really frustrating for foodservice businesses is that the new legislation that is passed, in some respects, impacts our environment even more negatively than allowing food industry operators to continue to have the freedom to use any grade of plastic for their packaging needs. In this editorial, I will cover **WHY OUR STATE GOVERNMENTS ARE BANNING PLASTIC, THE IMPACT OF PLASTIC LAWS,** and my own **SOLUTION** to the problem.

WHY OUR STATE GOVERNMENTS ARE BANNING PLASTIC – There are several states in the Western Region that are seeking to achieve"Zero Waste" by the year 2040. California is one of those states and to achieve this goal local city and county government agencies are passing legislation that bans single-use plastics in foodservice operations. Under bill SB 1335 California has begun banning single-use plastics in foodservice operations, on state-owned property, like airports, universities, state parks and military bases. Their next phase of legislation is expected to be directed at foodservice operations, on private property, so that they can then pass statewide laws that ban single-use plastics entirely and require the use of state-registered food packaging that also has to be BPI certified as safe for industrial composting. The goal of these stat governments is to divert plastic food packaging waste away from landfills and into commercial compost yards.

THE IMPACT OF PLASTIC LAWS – The ordinances and laws, passed by local, county and state governments is simply legislation that is based on misinformation. These laws are passed by legislators who do not know anything about plastic, or food packaging or the true economic impact that their signature on a bill is having on the state and even our national economy. When California state legislators passed SB270, a bill outlawing the use of plastic bags back in 2014, they did not understand and or realize their legislation would impact the California environment and foodservice operators in two ways.

One, to avoid putting a number of plastic bag manufacturers out of business they decided to change the legislation to allow grocery stores and restaurants to use a thicker plastic bag that they deemed as a "re-usable" bag and had to be at least 2.25 mils thick. What they did not realize with this decision is that not only were restaurants now going to pay three times as much but by allowing a 2.25 mil thick re-usable bag to be used, instead of a standard .5 mil bag, they actually ended up watching the consumers of California purge 45 times more plastic into landfills than before the law was passed.

Secondly, when foodservice operators and grocery stores tried to move away from plastic bags altogether, they found that the paper bag manufacturers could not keep up with the demand and so it left a huge void in the industry for bags. As of today, most foodservice operations remain confused about this law. Some try to order paper bags, which are not always available, some have gone back to the traditional .5 mil plastic bags and don't care about the new law and others are using a 2.25 mil thick plastic bag in cities or counties that require it.

In the end the bill forced thousands of restaurants to pay three times as much for a 2.25 mil re-usable bag, sent 45 times more plastic into landfill and ended up confusing everyone when paper bags became limited in availability as the preferred option.

THE SOLUTION – It is my opinion that striving to divert waste out of landfills is a good thing. However, passing confusing laws that yield even more plastic into landfills, forcing restaurant owners to pay three times as much for a to-go bag and limiting available bag options to foodservice businesses is not the answer. **What is the answer is that city, county, state and federal government agencies need to fund new efforts to assist local recycling companies to expand their operations and their collection services to businesses and residences so that businesses can have the freedom to use the style of bag that serves their operations well for their patrons.** In other words, what if businesses and residences had a plastic bag collection can alongside their recyclables can, that is alongside their green yard waste can, that is alongside their trash can. I walked into a large corporate office cafeteria one time and discovered that they have eight different waste and recycling stream cans to capture the flow of all of their cafeteria waste. As the saying goes if there is a will there is a way. There is no reason why businesses and residences cannot use more waste and recycling cans behind their operations to prevent specific waste from entering landfills. The millions of pounds of plastic that could be recycled, rather than banned or sent to landfill, could be used to sell in the after-market where state governments could require plastic bag manufacturers, and other plastic packaging manufacturers, to use a specific percentage of recycled post-consumer content in all of their bags and or in a variety of other plastic products like plastic food packaging, playground materials, fleece jackets and even shoelaces.

There is a solution for our pollution…it rests within the mighty pens of our government legislators who need to do us all a favor and pass a law that reverses the bans on plastic bags and single-use plastics and instead pass a bill that expands the infrastructure of our recycling centers to handle and manage more grades of plastics. All this additional recycled plastic could then be used to sell in the after-market to plastic manufacturers to make yet new plastic products.

PLASTICS

Plastic packaging has been using for many years and contains on a lot of advantages that any other non-plastic material may not provide you.

It is a great alternative to the other packaging that will allow the manufacturer or brands to get more with the less. It was a great invention of man that provides a lot of advantages such as beautiful packaging designs reduce the use of energy and give you an affordable and durable packaging as well.

Whether you will talk about cosmetic products, technology products or about the food you will get plastic packaging everywhere. It is considered the best way to keep all the products save.

It allows your food to stay fresh and healthy. It also helps to reduce the wastage that can affect your environment.

According to the study of British Plastics Federation it has seen that if we try to replace the plastic material with some other non-plastic material, it can become a cause of increment in the energy, packaging consumption, mass terms as well as the emissions of greenhouse gases.

It can also increase the cost that you spend on that packaging and the other parts as well.

The non-plastic materials that are used for the packaging purposes result in the emissions of greenhouse gases even 2.7 times more that is not good for our environment.

In 1862

During an International Exhibition that was held in London, the Alexander Parkes has introduced a first plastic material which is made by a man. It was a bio-based material which was derived by dubbed Parkesine form the cellulose. This material is considered best because it could be easily molded into the desired shape when it was heated and after cooling down, it was retained into its shape. It was a great and unique invention towards the packaging of different products.

PLASTIC MATERIAL CLASSIFICATIONS

NUMBER	RESIN GRADE	DESCRIPTION	RECYCLABLE	LANDFILL
1 PETE	PET, RPET & SELECT GRADES CPET POLYETHYLENE TEREPHTHALATE # 1 (RIC)*		YES	NO
2 HDPE	HDPE HIGH DENSITY POLYETHYLENE # 2 (RIC)*		YES	NO
3 PVC	PVC POLYVINYL CHLORIDE # 3 (RIC)*		YES	NO
4 LDPE	LDPE LOW DENSITY POLYETHYLENE # 4 (RIC)*		YES	NO
5 PP	PP POLYPROPYLENE # 5 (RIC)*		YES	NO
6 PS	OPS / EPS / GPPS ORIENTED POLYSTYRENE / EXPANDED POLYSTYRENE (FOAM) / GENERAL PURPOSE POLYSTYRENE # 6 (RIC)*		OK	YES
7 OTHER	OTHER MATERIALS BIO-MATERIALS BIOPLASTICS # 7 (RIC)*		NO	YES

*RIC, Resin International Code

IN THE EARLY 1990S

Dr. Jacques Edwin Brandenberger, who was an engineer of Swiss textile, was generated cellophane. It was a clear layer used for the product's packaging. This plastic wrap was the first waterproof and fully flexible plastic that was best to keep the products save. The primary aim of Brandenberger was to create clear, flexible plastic packaging that can help to cover the products and keep them maintain the stain resistance as well.

1930

This is another best year that plays an essential role in the success of plastic packaging. In 1930 a 3M engineer who is known as Richard Drew was created Scotch cellulose tape. After a few time, the name of tape was replaced by the Cellophane Tape. It was such a great invention in the packaging industry. It allows the manufacturer or company owners to use this tape to pack their products that provide excellent protection. It was an attractive way for the bakers and grocers to pack and sell their products such as foodie items by using this tape.

1933

In 1933 a new plastic was invented accidentally by the Ralph Wiley. He was a worker in Dow Chemical lab who was experimenting and discovered a plastic. It was polyvinylidene chloride and started to get popularity as SaranTM. For the very first time, this plastic is used to protect and pack the different military equipment, and after that, it was also started to use for the packaging of food. Saran was such a flexible plastic wrap that could easily use on any pot, bowl, or dishes, etc. It was an exceptional plastic that can keep your food, whether it was wrapped in a grocery store or at home as well.

1946

Tupperware is other types of plastic which are developed by Earl Silas Tupper in the United States. He was made a network of housewives who sold Tupperware to earn some money. Earl Silas Tupper was made this network to promote his line for the food containers that contained on polythene. In the history of plastic packaging or containers, Tupperware, as well as the other airtight plastic, made containers are considered best inventions. They allowed your food and any other product to stay safe inside the packaging because their airtight seal features didn't allow any dust, dirt or bacteria to enter inside the box. At that time the people were started to attract towards this product, and the sale for these plastic packaging was outstanding.

1946

It was the first plastic spray bottle that was created by the Dr. Jules Montenier at commercial level. Dr. Jules Montenier was the Stopette's creator. Stopette was a deodorant which was used for the underarms. To dispense the deodorant, the consumer needed to squeeze the plastic bottle. In that year "What's My Line" was the sponsor of a popular televisions show known as "What's My Line, he took advantage of that show, and he triggered an explosion in the unique use of plastic bottles.

1950

In 1950 a green or black garbage bag was created that was made from polyethylene material. Larry Hansen and Canadians Harry Wasylyk were the two great names who were the developers of these bags. These bags were developed to use at a commercial level that was first sold to Winnipeg General Hospital. After using at commercial level theses bags started to get popular for the home use to throw the garbage away. These plastic bags were durable that allowed the consumers to go through any garbage without the fear of tearing.

1954

It was another great year for the development of some unique and high-quality plastic packaging. The zipper storage bags were introduced in this year. Robert W. Vergobbi introduced it. Minigrip has licensed these bags and planned to use as pencil bags. But after some time they realize that the bag can do even much more than keeping the pencils.

1968

In the year 1968, when it was started to appear that the zipper storage bags are more than storage the pencils, new Ziploc bags were introduced. These bags were the best food storage bags, and they were used for the packaging of sandwiches or rolls.

1959

In 1959 the first character lunch box was introduced that was fully licensed. The producers of this lunch box were Frey, Paeschke and the Wisconsin manufacturer Geuder. It was a plastic lunch box along with a Mickey Mouse character that was lithographed on an oval shape tin. Inside this oval tin, there was a tray that the consumers could pull out easily. This tray was used to keep the meal covered and fresh as well. In 1960 first that plastic was used only for the handles and after little time it was started to use for the entire lunch box.

1960

The plastic wraps for bubble were created in 1960. Marc Chavannes and Engineers Alfred Fielding were the producers of these wraps. This is another best invention in the world of plastic packaging because these wraps are best to keep the things safe for a longer time.

1986

Before the plastic, aluminum was also considered the best material for the packaging. But in 1986 the aluminum trays were started to replace with the plastic trays. These plastic trays were best to use for the microwave.

1988

In 1988 a unique coding system was introduced that had a feature of voluntary resin identification. It was a great creation in the industry of plastics manufacturing. This system was excellent that help to identify the resins of plastic that companies are used in plastic packaging or containers.

1996

A new plastic packaging was introduced that helped to reduced the food wastage. It was known as a Salad in a bag. It helped to keep the vegetables and fruits fresh and maintain their nutritionist properties for a longer time.

2000

The flexible and durable plastic tubes for the yogurt were introduced. It allowed the consumer to take full advantage of healthier food by getting calcium and enjoying the taste as well. In 2000 the PLA (Polylactic acid) was made by using the corn that was based on bio-based packaging. It was another good plastic packaging that was given to the market.

2007

In 2007 a new trend of lightweight plastic packaging was introduced in the form of a 1-gallon plastic jug of mil and the 2 liters of a plastic beverage bottle. They became popular, and people started to use them wisely because they are light in weight and easy t carry as well.

2008

With time, the recycling rate of plastic packaging was started to increase. The plastic bottles were achieved a recycling rate of 27 percent by reclaiming the plastic of 2.4 billion pounds. On the other hand, the plastic wraps and bags that made from polythene achieved the recycling rate of 13 percent by reclaiming the plastic of 832 million pounds. These recycling rates were increased day by day.

2010

In 2010 the Metallyte were produced to pack the sharp material such as noodles, coffee, grains, and beans, etc. This plastic packaging was great because it allows the user to use the content inside the packaging without tearing the pack. This packaging design was based on foil that was light in weight.

Moreover, a company Heinz Dip & Squeeze has created a first plastic packaging for the ketchup. It contained dual functions that allow the consumer to enjoy the ketchup form both sides. The consumers could easily peel its lid or tea its tip t enjoy the ketchup with food. It was a great invention in the food world that makes your meal even more enjoyable.

WHY COMPANIES CONTRIBUTED TO PLASTIC PACKAGING?

Plastic packaging has a lot of benefits due to which the companies and people live to contribute to the production or manufacturing of plastic packaging.

There are some significant reasons due to which plastic packaging got more popularity as compare to alternatives.

SAVE ENERGY

As compared to the other packaging material, the plastic can consume less energy during the manufacturing process.

They are light in weight due to which you can easily use this packaging for transportation. It is also the best material that can reduce the emissions of greenhouse gases.

Lower use of energy means the lower consumption of fuel and money as well.

Due to the lower use of energy and reducing greenhouse gases emissions, plastic packaging has lower environmental impacts that may damage our life of 5

KEEP FOOD FRESH AND HEALTHY

It was one of the most difficult tasks for the people that how to kept their food fresh and healthier. Plastic packaging was the proper answer to their question.

Its great properties allow your food to stay fresh for a longer time and maintain its nutritionist values.

GREAT IMPROVEMENTS VIA INNOVATION

In the plastic packaging industry of United Kingdom, you can get a strong record for the plastic packaging.

The durability and flexibility of plastic are increasing day by day. New advancements in designs and technology allow the manufacturers to decrease the quantity of plastic that can be used for the provided quantity of any product.

For instance, in 1970 a plastic detergent bottle of 1 liter that was contained on 120 gms is now the weight of 43 gms only along with the reduction of 64 percent.

The ASTM International Resin Identification Coding System, often abbreviated RIC, is a set of symbols appearing on plastic products that identify the plastic resin out of which the product is made. It was developed in 1988 by the Society of the Plastics Industry (now the Plastics Industry Association) in the United States, but since 2008 it has been administered by ASTM International, an international standards organization.

The US Society of the Plastics Industry introduced the Resin Identification Code (RIC) system in 1988, when the organization was called Society of the Plastics Industry, Inc. (SPI). The SPI stated that one purpose of the original SPI code was to "Provide a consistent national system to facilitate recycling of post-consumer plastics." The system has been adopted by a growing number of communities implementing recycling programs, as a tool to assist in sorting plastics. In order to deal with the concerns of recyclers across the U.S., the RIC system was designed to make it easier for workers in materials recovery and recycling facilities to sort and separate items according to their resin type. Plastics must be recycled separately, with other like materials, in order to preserve the value of the recycled material, and enable its reuse in other products after being recycled.

In its original form, the symbols used as part of the RIC consisted of arrows that cycle clockwise to form a triangle that encloses a number. The number broadly refers to the type of plastic used in the product, by chronological order of when that plastic became recyclable:

- "1" signifies that the product is made out of polyethylene terephthalate (PET) (beverage bottles, cups, other packaging, etc.)
- "2" signifies high-density polyethylene (HDPE) (bottles, cups, milk jugs, etc.)
- "3" signifies polyvinyl chloride (PVC) (pipes, siding, flooring, etc.)
- "4" signifies low-density polyethylene (LDPE) (plastic bags, six-pack rings, tubing, etc.)
- "5" signifies polypropylene (PP) (auto parts, industrial fibers, food containers, etc.)
- "6" signifies polystyrene (PS) (plastic utensils, Styrofoam, cafeteria trays, etc.)
- "7" signifies other plastics, such as acrylic, nylon, polycarbonate and polylactic acid (PLA).

When a number is omitted, the arrows arranged in a triangle form the universal recycling symbol, a generic indicator of recyclability. Subsequent revisions to the RIC have replaced the arrows with a solid triangle, in order to address consumer confusion about the meaning of the RIC, and the fact that the presence of a RIC symbol on an item does not necessarily indicate that it is recyclable.

In 2008, ASTM International took over the administration of the RIC system and eventually issued ASTM D7611—Standard Practice for Coding Plastic Manufactured Articles for Resin Identification. In 2013 this standard was revised to change the graphic marking symbol of the RIC from the "chasing arrows" of the Recycling Symbol to a solid triangle instead.

Since its introduction, the RIC has often been used as a signifier of recyclability, but the presence of a code on a plastic product does not necessarily indicate that it is recyclable any more than its absence means the plastic object is [necessarily] unrecyclable.

Over time, the plastic packaging has been changing and moving towards the unique and innovative manufacturing. After reading this history it becomes very apparent how important plastics are to our economy and especially to our needs to use it to pack food and millions of other commercial retail products. In the pages ahead this guide reviews in detail all of the different grades of plastics.

HOW IS PLASTIC MADE?

Plastic is a bi-product of natural gas. Resin manufacturers molecularly modify natural gas molecules through a reactor process which turns it into resin. What most people don't realize is that natural gas is derived from crude oil which is buried deep below our earth's surface. Crude oil is derived from fossilized carbon cells that have been compressed deep below the earth's crust for millions of years. Carbon cells originally come from the sun. Those carbon cells that rest into microscopic plankton and proliferate in shallow warm oceans eventually settle down into the ocean floor and accumulate over time. The accumulation of carbon cells creates layers below the ocean floor, seeping closer and closer to the earth's crust where the carbon cells are baked into a mulch (Shale rock), then a liquid (Crude oil) and eventually into a gas (Natural gas).

So if plastic is of this earth, then isn't it technically an organic biodegradable material that is compostable? Technically yes, in theory, but in reality no, because the natural gas molecules that make up plastic are manipulated inside of the reactor process that bonds them differently, which prevents the composition of the plastic from biodegrading on its own under ideal compost conditions. Since plastic will not biodegrade on its own, some factories add different biodegradable additives, like corn starch, that will activate the microorganisms which will eat away at the plastic in a compost environment and accelerate its decomposition process. Although biodegradable plastics have grown into a multi-billion dollar industry, waste collection agencies don't recognize or accept plastic as a material that is qualified for composting. Today most plastic is primarily recycled and re-used. To the right is a chart that breaks down the different recycling classifications for plastic, as well as their intended use in food applications.

Sources: ALPPM.com, Wikipedia.org

PLASTICS - # 1 (PET) POLYETHYLENE TEREPHTHALATE

PET, which stands for polyethylene terephthalate, is a clear, strong and lightweight plastic belonging to the polyester family.

It is typically called “polyester” when used for fibers or fabrics, and “PET” or “PET Resin” when used for bottles, jars, containers and packaging applications.

PET is the world’s packaging choice for many foods and beverages because it is hygienic, strong, lightweight, shatterproof, and retains freshness. It is most commonly used to package carbonated soft drinks, water as well as a vast number of foodservice packaging products in a variety of shapes and sizes. Consumers can identify PET containers by the triangular #1 resin identification code found on the bottom of PET bottles and jars.

THINK OF PET AS #1

Virtually all single-serving and 2-liter bottles of sodas and water sold in the U.S. are made from PET plastic. PET is also popular for packaging salad dressings, cooking oil, peanut butter, shampoo, liquid hand soap, mouthwash, and other personal care items. Special grades of PET are used for take-out containers and prepared food trays that can be warmed in the oven or microwave.

PET is a very inert material that is resistant to attack by micro-organisms, and does not react with food products, which is why it is widely preferred for packaging foods, beverages and pharmaceuticals. Health-safety agencies around the world have approved PET as safe for use with foods and beverages.

Best of all, PET is recyclable and highly sustainable. It is the most recycled plastic in the United States and worldwide. PET can be recycled again and again – back into containers for foods, beverages and personal care products – or into carpet, clothing, automotive parts, construction materials, industrial strapping, and scores of other products.

Although the feedstocks for PET are petroleum based, the environmental impact of PET is very favorable in comparison to glass, aluminum and other recyclable container materials. That’s because the light weight and strength of PET allows more product to be delivered with less packaging weight and less fuel than most other container materials.

HOW PET IS MADE

The basic building blocks of PET are ethylene glycol and terephthalic acid, which are combined to form pellets of PET. These resin pellets are then heated to a molten liquid that can be easily extruded or molded into items of practically any shape.

More specifically, when the two raw materials of PET are combined under high temperatures and low vacuum pressure, long chains of the polymer are formed. As the mixture becomes thicker, the chains grow longer. Once the appropriate chain length is achieved, the reaction is stopped. The resulting spaghetti-like strands of PET are then extruded, quickly cooled, and cut into small pellets.

When the resin pellets are reheated to a molten liquid stage, the polymer chains can be stretched in one direction (for fibers) or in two directions (for bottles and films). If the polymer is cooled quickly while it is stretched, the chains are frozen with their orientation intact. Once set in stretched form, the material is extremely tough.

If PET is held in the stretched form at elevated temperatures, it slowly crystallizes and starts to become opaque, more rigid and less flexible. This crystalline form PET is often used for take-home and prepared-food containers and trays that can be reheated in the oven or microwave.

HISTORY

PET was first synthesized in the U.S. during the mid-1940s by DuPont chemists, who were searching for polymers that could be used to make new textile fibers. DuPont would later brand these polyester fibers as “Dacron.”

In the late 1950s, researchers found a way to stretch a thin extruded sheet of PET to create PET film, which today is used extensively as video, photographic and X-ray film, as well as for packaging films.

In the early 1970s, the technology was developed to allow for the blow-stretch molding of PET into strong, lightweight and shatterproof bottles. In 1973, the PET bottle was patented and quickly gained market acceptance. In 1977, the first PET bottle was recycled.

Today PET is one of the world’s most commonly used, versatile and trusted materials. More than half of the world’s synthetic fiber is made from PET, and almost all individual-sized and 2-liter bottles of carbonated soft drinks and water sold in the U.S. are made from PET resin.

PET in its natural state is a colorless, semi-crystalline resin. Based on how it is processed, PET can be semi-rigid to rigid, and it is very lightweight. It makes a good gas and fair moisture barrier, as well as a good barrier to alcohol (requires additional “barrier” treatment) and solvents. It is strong and impact-resistant. PET becomes white when exposed to chloroform and also certain other chemicals such as toluene.

About 60% crystallization is the upper limit for commercial products, with the exception of polyester fibers. Clear products can be produced by rapidly cooling molten polymer below Tg glass transition temperature to form an amorphous solid. Like glass, amorphous PET forms when its molecules are not given enough time to arrange themselves in an orderly, crystalline fashion as the melt is cooled. At room temperature the molecules are frozen in place, but, if enough heat energy is put back into them by heating above Tg, they begin to move again, allowing crystals to nucleate and grow. This procedure is known as solid-state crystallization.

When allowed to cool slowly, the molten polymer forms a more crystalline material. This material has spherulites containing many small crystallites when crystallized from an amorphous solid, rather than forming one large single crystal. Light tends to scatter as it crosses the boundaries between crystallites and the amorphous regions between them. This scattering means that crystalline PET is opaque and white in most cases. Fiber drawing is among the few industrial processes that produce a nearly single-crystal products.

One of the most important characteristics of PET is referred to as intrinsic viscosity (IV).

The intrinsic viscosity of the material, found by extrapolating to zero concentration of relative viscosity to concentration which is measured in deciliters per gram (dℓ/g). Intrinsic viscosity is dependent upon the length of its polymer chains but has no units due to being extrapolated to zero concentration. The longer the polymer chains the more entanglements between chains and therefore the higher the viscosity. The average chain length of a particular batch of resin can be controlled during polycondensation.

THE INTRINSIC VISCOSITY RANGE OF PET:

Fiber grade:

0.40–0.70 Textile

0.72–0.98 Technical, tire cord

Film grade:

0.60–0.70 BoPET (biaxially oriented PET film)

0.70–1.00 Sheet grade for thermoforming

Bottle grade:

0.70–0.78 Water bottles (flat)

0.78–0.85 Carbonated soft drink grade

Monofilament, engineering plastic

SOURCES: PETresin.org, Wikipedia.org

PLASTICS - # 2 (HDPE) HIGH DENSITY POLYETHYLENE

High-density polyethylene (HDPE) or polyethylene high-density (PEHD) is a thermoplastic polymer produced from the monomer ethylene. It is sometimes called "alkathene" or "polythene" when used for HDPE pipes. With a high strength-to-density ratio, HDPE is used in the production of plastic bottles, corrosion-resistant piping, geomembranes and plastic lumber. HDPE is commonly recycled and has the number "2" embossed usually at the bottom of all products.

HDPE is known for its high strength-to-density ratio. The density of HDPE can range from 930 to 970 kg/m3. Although the density of HDPE is only marginally higher than that of low-density polyethylene, HDPE has little branching, giving it stronger intermolecular forces and tensile strength than LDPE. The difference in strength exceeds the difference in density, giving HDPE a higher specific strength. It is also harder and more opaque and can withstand somewhat higher temperatures (120 °C/248 °F for short periods). High-density polyethylene, unlike polypropylene, cannot withstand normally required autoclaving conditions. The lack of branching is ensured by an appropriate choice of catalyst (e.g., Ziegler–Natta catalysts) and reaction conditions.

HDPE IS RESISTANT TO MANY DIFFERENT SOLVENTS.

The physical properties of HDPE can vary depending on the molding process that is used to manufacture a specific sample; to some degree a determining factor are the international standardized testing methods employed to identify these properties for a specific process. For example, in Rotational Molding, to identify the environmental stress crack resistance of a sample, the Notched Constant Tensile Load Test (NCTL) is put to use.

HDPE is also used for cell liners in subtitle D sanitary landfills, wherein large sheets of HDPE are either extrusion welded or wedge welded to form a homogeneous chemical-resistant barrier, with the intention of preventing the pollution of soil and groundwater by the liquid constituents of solid waste.

HDPE is preferred by the pyrotechnics trade for mortars over steel or PVC tubes, being more durable and safer: HDPE tends to rip or tear in a malfunction instead of shattering and becoming shrapnel like the other materials. HDPE can also be thermoformed into food packaging or even squirted into molds to make unique shapes of products in a process known as injection molding.

Milk bottles, jugs, and other hollow goods manufactured through blow molding are the most important application area for HDPE, accounting for one-third of worldwide production, or more than 8 million tons. HDPE is also used to make can liners for janitorial waste applications.

Above all, China, where beverage bottles made from HDPE were first imported in 2005, is a growing market for rigid HDPE packaging, as a result of its improving standard of living. In India and other highly populated, emerging nations, infrastructure expansion includes the deployment of pipes and cable insulation made from HDPE. The material has benefited from discussions about possible health and environmental problems caused by PVC and polycarbonate associated bisphenol A (BPA), as well as its advantages over glass, metal, and cardboard.

SOURCES: Wikipedia.org

PLASTICS - # 3 (PVC) POLYVINYLCHLORIDE

Polyvinyl chloride or PVC was first created by the German chemist Eugen Baumann in 1872. Eugen Baumann never applied for a patent. Polyvinylchloride (colloquial: polyvinyl, vinyl; abbreviated: PVC) is the world's third-most widely produced synthetic plastic polymer (after polyethylene and polypropylene). About 40 million tons of PVC are produced each year.

PVC comes in two basic forms: rigid (sometimes abbreviated as RPVC) and flexible. The rigid form of PVC is used in construction for pipe and in profile applications such as doors and windows. It is also used in making bottles, disposable gloves, non-food packaging, food-covering sheets, and cards (such as bank or membership cards). It can be made softer and more flexible by the addition of plasticizers, the most widely used being phthalates. In this form, it is also used in plumbing, electrical cable insulation, imitation leather, flooring, signage, phonograph records, inflatable products, and many applications where it replaces rubber. With cotton or linen, it is used in the production of canvas.

Pure polyvinyl chloride is a white, brittle solid. It is insoluble in alcohol but slightly soluble in tetrahydrofuran.

Polyvinyl chloride or PVC was never patented until 1913 when German, Friedrich Klatte invented a new method of the polymerization of vinyl chloride using sunlight.

Friedrich Klatte became the first inventor to receive a patent for PVC. However, no really useful purpose for PVC was found until Waldo Semon came along and made PVC a better product. Semon had been quoted as saying, "People thought of PVC as worthless back then [circa 1926]. They'd throw it in the trash."

WALDO SEMON - USEFUL VINYL

In 1926, Waldo Lonsbury Semon was working for the B.F. Goodrich Company in the United States as a researcher, when he invented plasticized polyvinyl chloride.

Waldo Semon had been trying to dehydrohalogenate polyvinyl chloride in a high boiling solvent in order to obtain an unsaturated polymer that could bond rubber to metal.

For his invention, Waldo Semon received United States patents #1,929,453 and #2,188,396 for the "Synthetic Rubber-like Composition and Method of Making Same; Method of Preparing Polyvinyl Halide Products."

ALL ABOUT VINYL

Vinyl is the second most produced plastic in the world. The first products from vinyl that Walter Semon produced were golf balls and shoe heels. Today, hundreds of products are made from vinyl, including shower curtains, raincoats, wires, appliances, floor tiles, paints and surface coatings.

According to the Vinyl Institute, "like all plastic materials, vinyl is made from a series of processing steps that converts raw materials (petroleum, natural gas or coal) into unique synthetic products called polymers."

The Vinyl Institute states that vinyl polymer is unusual because it is based only in part on hydrocarbon materials (ethylene obtained by processing natural gas or petroleum), the other half of the vinyl polymer is based on the natural element chlorine (salt). The resulting compound, ethylene dichloride, is converted at very high temperatures to vinyl chloride monomer gas. Through the chemical reaction known as polymerization, vinyl chloride monomer becomes polyvinyl chloride resin that can be used to produce an endless variety of products.

Phthalates, which are incorporated into plastics as plasticizers, comprise approximately 70% of the US plasticizer market; phthalates are by design not covalently bound to the polymer matrix, which makes them highly susceptible to leaching. Phthalates are contained in plastics at high percentages. For example, they can contribute up to 40% by weight to intravenous medical bags and up to 80% by weight in medical tubing. Vinyl products are pervasive—including toys, car interiors, shower curtains, and flooring—and initially release chemical gases into the air. Some studies indicate that this outgassing of additives may contribute to health complications, and have resulted in a call for banning the use of DEHP on shower curtains, among other uses.Japanese car companies Toyota, Nissan, and Honda eliminated the use of PVC in car interiors since 2007.

In 2004 a joint Swedish-Danish research team found a statistical association between allergies in children and indoor air levels of DEHP and BBzP (butyl benzyl phthalate), which is used in vinyl flooring. In December 2006, the European Chemicals Bureau of the European Commission released a final draft risk assessment of BBzP which found "no concern" for consumer exposure including exposure to children

SOURCES: Wikipedia.org, Piper.plastics.com

PLASTICS - # 4 (LDPE) LOW DENSITY POLYETHYLENE

Low-density polyethylene (LDPE) is a thermoplastic made from the monomer ethylene. It was the first grade of polyethylene, produced in 1933 by Imperial Chemical Industries (ICI) using a high pressure process via free radical polymerization. Its manufacture employs the same method today. The EPA estimates 5.7% of LDPE (recycling number 4) is recycled in the United States. Despite competition from more modern polymers, LDPE continues to be an important plastic grade. In 2013 the worldwide LDPE market reached a volume of about US $33 billion dollars.

LDPE is defined by a density range of 0.917–0.930 g/cm3. It is not reactive at room temperatures, except by strong oxidizing agents, and some solvents cause swelling. It can withstand temperatures of 80 °C continuously and 90 °C (194 °F) for a short time. Made in translucent or opaque variations, it is quite flexible and tough.

LDPE has more branching (on about 2% of the carbon atoms) than HDPE, so its intermolecular forces (instantaneous-dipole induced-dipole attraction) are weaker, its tensile strength is lower, and its resilience is higher. Also, because its molecules are less tightly packed and less crystalline due to the side branches, its density is lower. LDPE has a lower "density" than HDPE. That just means it has a bit less mass compared to its volume. For example, lead is dense. Whipped cream is not.

LDPE also has more molecules that branch out, as opposed to staying in perfect rows.

LDPE's lower density and branched molecules give it somewhat different properties than HDPE, although they do share some similar uses, such as packaging. LDPE/HDPE differences typically cause them to be collected separately for recycling.

LDPE is resistant to impact (doesn't break easily), moisture (water proof), and chemicals (can stand up to many hazardous materials).

CHEMICAL RESISTANCE

- Excellent resistance (no attack/no chemical reaction) to dilute and concentrated acids, alcohols, bases and esters
- Good resistance (minor attack/very low chemical reactivity) to aldehydes, ketones and vegetable oils
- Limited resistance (moderate attack/significant chemical reaction, suitable for short-term use only) to aliphatic and aromatic hydrocarbons, mineral oils, and oxidizing agents
- Poor resistance, and not recommended for use with halogenated hydrocarbons.

SOURCES: Wikipedia.org

PLASTICS - # 5 (PP) POLYPROPYLENE

Polypropylene (PP), also known as polypropene, is a thermoplastic polymer used in a wide variety of applications. It is produced via chain-growth polymerization from the monomer propylene.

Polypropylene belongs to the group of polyolefins and is partially crystalline and non-polar. Its properties are similar to polyethylene, but it is slightly harder and more heat resistant. It is a white, mechanically rugged material and has a high chemical resistance.Polypropylene is the second-most widely produced commodity plastic (after polyethylene) and it is often used in packaging and labeling. In 2019, the global market for polypropylene was worth $126.03 billion

Propylene was first polymerized to a crystalline isotactic polymer by Giulio Natta as well as by the German chemist Karl Rehn in March 1954. This pioneering discovery led to large-scale commercial production of isotactic polypropylene by the Italian firm Montecatini from 1957 onwards.

After polyethylene, polypropylene is the most profitable plastic with revenues expected to exceed US$145 billion by 2019. The sales of this material are forecast to grow at a rate of 5.8% per year until 2021.

CHEMICAL AND PHYSICAL PROPERTIES

Polypropylene is in many aspects similar to polyethylene, especially in solution behaviour and electrical properties. The methyl group improves mechanical properties and thermal resistance, although the chemical resistance decreases. The properties of polypropylene depend on the molecular weight and molecular weight distribution, crystallinity, type and proportion of comonomer (if used) and the isotacticity. In isotactic polypropylene, for example, the methyl groups are oriented on one side of the carbon backbone. This arrangement creates a greater degree of crystallinity and results in a stiffer material that is more resistant to creep than both atactic polypropylene and polyethylene.

THERMAL PROPERTIES

The melting point of polypropylene occurs in a range, so the melting point is determined by finding the highest temperature of a differential scanning calorimetry chart. Perfectly isotactic PP has a melting point of 171 °C (340 °F). Commercial isotactic PP has a melting point that ranges from 160 to 166 °C (320 to 331 °F), depending on atactic material and crystallinity. Syndiotactic PP with a crystallinity of 30% has a melting point of 130 °C (266 °F). Below 0 °C, PP becomes brittle.

The thermal expansion of polypropylene is very large, but somewhat less than that of polyethylene.

Polypropylene is used widely in the food industry today with dozens of manufacturers using virgin and recycled PP to thermoform or inject it into molds to make different shapes and sizes of disposable food packaging. PP is sought after enough in the recycling stream that it has a # 5 as it's classification.

SOURCES: Wikipedia.org

PLASTICS - # 6 (PS)
EXPANDED POLYSTYRENE

Why do so many cities and states across North America ban foam food packaging products from their waste streams? The concerns seem to be that foam cups and or foam clamshells are not biodegradable, and foam can be harmful to birds, fish and wildlife who might ingest it since it floats around in the water and it is difficult to recycle. These are valid points but what most environmentalists and government officials don't realize is that foam also has many attributes and is a material that is vastly misunderstood.

Expanded polystyrene, or EPS as it is also known, is a rigid closed-cell substrate that is capable of being manipulated in the manufacturing process to make a variety of residential, commercial as well as industrial products because of its low weight rigidity and formability. Foam is actually a plastic that is growing in demand with a market cap of over $15 billion expected by the year 2020. Yes, it's true that in the world of foodservice packaging it has developed a bad reputation, **but the hidden truth is that foam has a lot of attributes that most people ignore or don't seem to want to acknowledge. For example, it's an incredibly insulating material and is ideal for hot liquids like coffee, hot meals for take-out, and it's even used in the inner linings of most camping coolers. Foam is also the lowest cost material for foodservice packaging that is available on the market today, which is a huge benefit to restaurant owners' budgets. Foam can also be recycled, and is, for the most part, in select cities across North America.** The material is made from EPS beads and gas—when the beads are separated from the gas they can be used again to make other products. Yes, foam has its challenges, but it is still today one of the top choices for disposable food packaging.

EXPANDED POLYSTYRENE (EPS)

BENEFITS

- Insulates heat better than any other packaging material.
- Lowest cost of any other packaging material.
- Highly flexible and formable, which gives it a big advantage in how it can be molded into a variety of different shapes and sizes for thousands of applications.
- Lightweight and easy to ship, carry and use in a variety of applications.
- Absorbs ink and displays custom printed graphics well.
- Can be crushed easily into recycling bricks.

DISADVANTAGES

- Will not biodegrade in a compost yard or in waterways.
- It is difficult to recycle, due to its lightweight structure.
- Environmentally unsafe for fish, birds and wildlife who might ingest it.
- Contaminates waste streams, oceans and even freeways, where it can be a hazard.
- Cracks easily and is not ideal for all applications.
- Has been added to California's Prop 65 list of identified carcinogens

PLASTICS - ORIENTED POLYSTYRENE

Polystyrene (PS) is a synthetic aromatic hydrocarbon polymer made from the monomer known as styrene. Polystyrene can be solid or foamed. General-purpose polystyrene is clear, hard, and rather brittle. It is an inexpensive resin per unit weight. It is a rather poor barrier to oxygen and water vapour and has a relatively low melting point. Polystyrene is one of the most widely used plastics, the scale of its production being several million tons per year. Polystyrene can be naturally transparent, but can be colored with colorants. Uses include protective packaging (such as packing peanuts and CD and DVD cases), food packaging containers, lids, bottles, trays, tumblers, disposable cutlery and in the making of models.

As a thermoplastic polymer, polystyrene is in a solid (glassy) state at room temperature but flows if heated above about 100 °C, its glass transition temperature. It becomes rigid again when cooled. This temperature behavior is exploited for extrusion (as in Styrofoam) and also for molding and vacuum forming, since it can be cast into molds with fine detail.

Under ASTM standards, polystyrene is regarded as not biodegradable. It is accumulating as a form of litter in the outside environment, particularly along shores and waterways, especially in its foam form, and in the Pacific Ocean.

In chemical terms, polystyrene is a long chain hydrocarbon wherein alternating carbon centers are attached to phenyl groups (a derivative of benzene). it contains the chemical elements carbon and hydrogen.

The material's properties are determined by short-range van der Waals attractions between polymers chains. Since the molecules consist of thousands of atoms, the cumulative attractive force between the molecules is large. When heated (or deformed at a rapid rate, due to a combination of viscoelastic and thermal insulation properties), the chains are able to take on a higher degree of conformation and slide past each other. This intermolecular weakness (versus the high intramolecular strength due to the hydrocarbon backbone) confers flexibility and elasticity. The ability of the system to be readily deformed above its glass transition temperature allows polystyrene (and thermoplastic polymers in general) to be readily softened and molded upon heating. Extruded polystyrene is about as strong as an unalloyed aluminium but much more flexible and much less dense (1.05 g/cm3 for polystyrene vs. 2.70 g/cm3 for aluminium).

Extruded polystyrene foam (XPS) consists of closed cells. It offers improved surface roughness, higher stiffness and reduced thermal conductivity. The density range is about 28–45 kg/m3.

Extruded polystyrene material is also used in crafts and model building, in particular architectural models. Because of the extrusion manufacturing process, XPS does not require facers to maintain its thermal or physical property performance. Thus, it makes a more uniform substitute for corrugated cardboard. Thermal conductivity varies between 0.029 and 0.039 W/(m·K) depending on bearing strength/density and the average value is ~0.035 W/(m·K).

Water vapour diffusion resistance (μ) of XPS is around 80–250.

Common extruded polystyrene foam materials include:

- Styrofoam, also known as Blue Board
- Depron, a thin insulation sheet used for model building

WATER ABSORPTION OF POLYSTYRENE FOAMS

Although it is a closed-cell foam, both expanded and extruded polystyrene are not entirely waterproof or vaporproof. In expanded polystyrene there are interstitial gaps between the expanded closed-cell pellets that form an open network of channels between the bonded pellets, and this network of gaps can become filled with liquid water. If the water freezes into ice, it expands and can cause polystyrene pellets to break off from the foam. Extruded polystyrene is also permeable by water molecules and can not be considered a vapor barrier.

Waterlogging commonly occurs over a long period of time in polystyrene foams that are constantly exposed to high humidity or are continuously immersed in water, such as in hot tub covers, in floating docks, as supplemental flotation under boat seats, and for below-grade exterior building insulation constantly exposed to groundwater. Typically an exterior vapor barrier such as impermeable plastic sheeting or a sprayed-on coating is necessary to prevent saturation.

ORIENTED POLYSTYRENE

Oriented polystyrene (OPS) is produced by stretching extruded PS film, improving visibility through the material by reducing haziness and increasing stiffness. This is often used in packaging where the manufacturer would like the consumer to see the enclosed product. Some benefits to OPS are that it is less expensive to produce than other clear plastics such as polypropylene (PP), polyethylene terephthalate (PET), and high-impact polystyrene (HIPS), and it is less hazy than HIPS or PP. The main disadvantage to OPS is that it is brittle, and will crack or tear easily.

Polystyrene is a commonly used resin the food industry today. It is brittle and sensitive to heat but it is cost effective for select styles of food and commercial packaging. It is not as sought after in the after market once it has been recycled and so it is classified as a # 6 on the recycle chart.

SOURCES: Wikipedia.org

PLASTICS - # 7 (OTHER) BIO & MIXED PLASTICS

So far this guide has covered the most used grades of plastic numbered 1-6. There is one more grade known as # 7. Number 7 is for all plastics other than those identified by number 1-6 and also plastics that may be layered or mixed with other types of plastics, such as bioplastics which will be covered in later chapters in this guide.

Polycarbonate (PC) is the other grade of plastic classified under # 7 and is actually the most common plastic in this category. It has not been used as much in recent years due to it being associated with bisphenol A (BPA). However, PC is tough, stable, and transparent, polycarbonate is an excellent engineering plastic that is as clear as glass and two hundred and fifty times stronger. Thirty times stronger than acrylic, clear polycarbonate sheets are also easily worked, molded, and thermo-formed or cold-formed. Although extremely strong and impact-resistant, polycarbonate plastic possesses inherent design flexibility. Unlike glass or acrylic, polycarbonate plastic sheets can be cut or cold-formed on site without pre-forming and fabrication. Polycarbonate plastic is in a wide variety of products including greenhouses, DVDs, sunglasses, police riot gear, and more.

Memorizing all of those 7 different types of plastic could be overwhelming, so here are several key points you need to remember:

1. Though it varies between types, every single category of plastic could leach hazardous materials if put in an extreme situation such as extreme heat.
2. 4 types of plastic that are considered as safer options among the others are Polyethylene Terephthalate (PET), High-Density Polyethylene (2-HDPE), 1-CPET or crystallized polyethylene terethalate and Polypropylene (5-PP).
3. Although the experts are currently working on inventing the best method and strategy to recycle all of those types of plastic, the 2 types of plastic that are mostly picked up by the recycling programs are Polyethylene Terephthalate (1-PET) and High-Density Polyethylene (2-HDPE). That is why they are classified as # 1 and # 2.

We hope this chapter helped clarify the many types of diverse grades of resins and plastics so that you can make better decisions about which type of plastic makes the most sense for your operational applications.

ENVIRONMENTAL WASTE

It's important to know about the impact that the packaging material or substrate that you choose, for your foodservice applications, has on the waste and recycling streams in any given city, county and or state. It is estimated that each year over 18 billion pounds of waste enters the world's ocean from coastal regions. That's about equivalent to five grocery bags of trash piled up on every foot of coastline on the planet. All that waste is causing harm to the creatures that live in the ocean. New research is emerging about the possible long-term impacts of tiny pieces of waste on the marine food chain—raising fresh questions about how it might ultimately impact human health and food security. Some packaging materials are actually not as bad in the waste or recycling stream as one might think, while others are ironically a larger problem than anticipated. As an example to some, paper coffee cups are considered better for the environment than foam (EPS) coffee cups. Ironically, paper hot cups come from trees that have to be cut down to make the paperboard. In addition, the paperboard is laminated with a thin poly film on the inside of the cup, for moisture and heat retention, which makes the cup neither recyclable nor compostable unless a hydrapulper is used to separate the poly film from the paperboard cup. Most people don't realize that a foam hot cup can be recycled, and where recycling centers exist, crushed down and used again to make other products.

Moreover, although plastic grocery style t-shirt bags have been banned, in many Western cities, they can also be recycled and used again where paper shopper grocery bags come from cut down trees, are more expensive, are not as strong and are typically not recycled and used again in most cities due to food stains and wear. **In reality anything can be recycled and used again in some form or another if the right infrastructure was set up, with each waste center in every city, to withstand the volume of recycled materials from businesses and consumers.** Many believe that the packaging materials are the problem. This is not the case at all. The real problem is that our local and county governments and municipal waste centers are still trying to resolve how to build a dedicated channel for each type of material that is tossed in the recycling or the garbage can. **However, the challenge for our society goes even deeper as even if there was a dedicated recycling channel for all of the varieties of packaging materials, that we dispose of every day, there is no real demand for most of these materials in the open market to be used again for another purpose or as another product.** The statistics to the right will demonstrate just how big of a problem this has become where if only the appropriate recycling channels and afterlife demand did exist then perhaps waste, as we know it today, might not be such an ugly topic.

TOP 10 ITEMS FOUND ON THE WORLD'S BEACHES

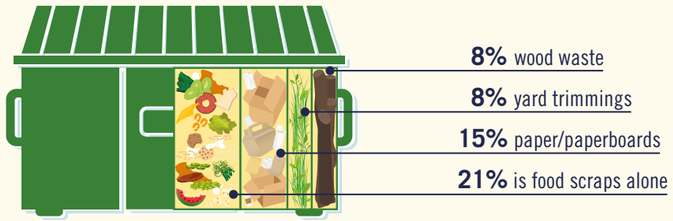
Measured in metric ton (MT) and million metric ton (MMT)

1. **2,117,931** - Cigarettes / Cigarette Filters
2. **1,140,222** - Food Wrappers / Containers
3. **1,065,171** - Plastic Beverage Bottles
4. **1,019,902** - Plastic Bags
5. **958,893** - Caps, Lids
6. **692,767** - Cups, Plates, Forks, Knives, Spoons
7. **611,048** - Straws, Stirrers
8. **521,730** - Glass Beverage Bottles
9. **339,875** - Beverage Cans
10. **298,332** - Paper Bags

SOURCE: oceanconservancy.org

Every year, U.S. landfills and trash incinerators receive **167 MILLION TONS** of garbage.

>50% of typical municipal garbage set out at the curb is compostable.



SOURCE: ilsr.org

PLASTIC WASTE INPUTS FROM LAND INTO THE OCEAN

Measured in metric ton (MT) and million metric ton (MMT)

- **270 MMT** - Global plastic production
- **275 MMT** - Total plastic waste
- **99.5 MMT** - Coastal plastic waste
- **31.9 MMT** - Coastal mismanaged plastic waste
- **8 MMT** - Coastal mismanaged plastic waste
- **6,350-245,000 MT** - Estimated mass of plastic waste floating at the ocean surface

SOURCE: jambeck.engr.uga.edu

ENVIRONMENTAL WASTE

Foodservice packaging is not really the biggest source of the environmental problem we're facing with our ozone. There are both natural and human sources of methane emissions. The main natural sources include wetlands, termites and the oceans. Natural sources create 36% of methane emissions. Human sources include landfills and livestock farming. However, the most important source being the production, transportation and use of fossil fuels. Human-related sources create the majority of methane emissions, accounting for 64% of the total.

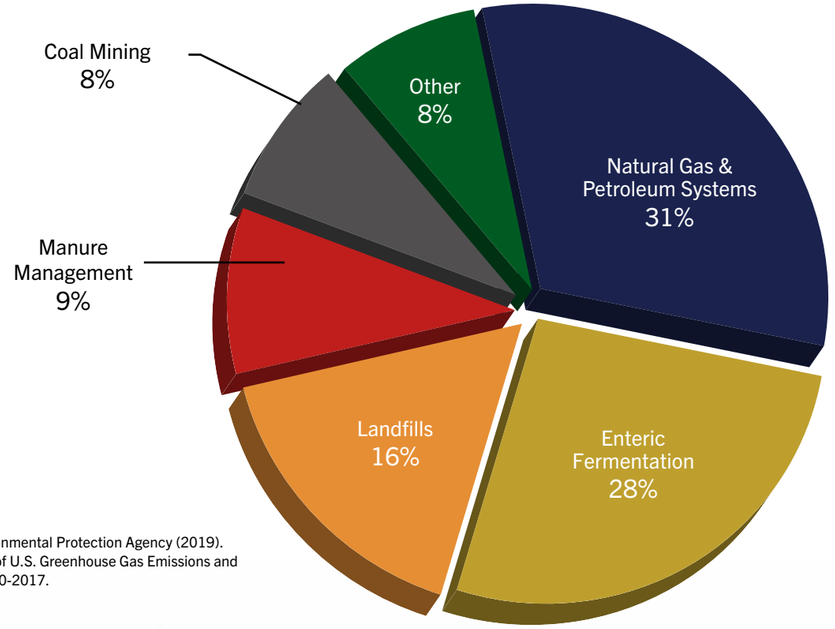
Methane levels have more than doubled over the last 150 years. This is because of human activities like fossil fuel use and intensive farming. Before the Industrial Revolution, natural sinks kept methane levels in a safe range.

Humans are creating methane emissions a lot faster than the Earth can remove them. Which has increased global methane levels. During the last 800,000 years, methane concentrations have always varied between 350-800 ppb. Since the Industrial Revolution, methane levels have become much higher. So much so that they are now 2.5 times larger.

METHANE EMISSIONS: HUMAN SOURCES

Since the Industrial Revolution, human sources of methane emissions have been growing. Fossil fuel production and intensive livestock farming have caused the current increase methane levels. Together these two sources are responsible for 60% of all human methane emissions. Other sources include landfills and waste (16%), biomass burning (11%), rice agriculture (9%) as well as biofuels (4%).

MAIN SOURCES OF METHANE



U.S. Environmental Protection Agency (2019). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2017.

FIGURE 1: Contribution of anthropogenic and natural sources to atmospheric methane variability.

SOURCE: Bousquet, P. et al. (2006).

FOSSIL FUEL PRODUCTION, DISTRIBUTION & USE

The largest human source is from the production, distribution and combustion of fossil fuels. This creates 33% of human methane emissions.

Methane emissions get produced wherever there are fossil fuels. It gets released whenever fossil fuels get extracted from the earth. Whether it is natural gas (which is in most part methane), coal or petroleum. More methane gets released during any type of handling, transportation (pipeline, truck delivery, etc.) or refinement of fossil fuels. Finally some methane is also produced during fossil fuel combustion.

LIVESTOCK FARMING

An important source of methane emissions is from enteric fermentation in farm animals. This creates 27% of human methane emissions. Animals like cows, sheep and goats are examples of ruminant animals. During their normal digestion process they create large amounts of methane. Enteric fermentation occurs because of microorganisms in the stomach of these animals. This creates methane as a by-product that is either exhaled by the animal or released via flatus.

LANDFILL WASTE

Another important human source of methane emissions is from landfills and waste. Methane gets generated by the decomposition of solid waste in landfills. This also happens with animal and human waste streams. This accounts for 16% of human methane emissions. Landfills and waste produces 55 million tons of methane per year.

BIOMASS BURNING

Biomass burning causes a large amount of methane emissions. Biomass is material from living or dead organic matter. Incomplete burning of biomass creates methane emissions. Huge amounts can get produced during a large scale fire. This creates 11% of human methane.

RICE AGRICULTURE

Another large human source of methane emissions is from rice agriculture. Paddy fields for rice production are man-made wetlands. They have high moisture content, are oxygen depleted and have ample organic material. This creates a great environment for methane producing microbes.

BIOFUELS

Each year biofuels produce 12 million tons of methane, making it a significant source. Any biomass used to produce energy for domestic or purposes counts as a biofuel. Incomplete biofuel combustion leads to the production of methane. This creates 4% of human methane emissions.

METHANE EMISSIONS: NATURAL SOURCES

Methane is also released into the atmosphere by natural processes. Wetlands, termites and the oceans are all natural sources of methane emissions.

Wetlands - Wetlands are the largest natural source of methane. This produces 78% of natural methane emissions. The water-logged conditions of wetlands are perfect for microbes. They need environments with no oxygen and abundant organic matter.

Termites - Termites are a significant natural source of methane. During the normal digestion process of a termite, methane gets produced. Termites eat cellulose but rely on micro-organisms in their gut to digest it. These micro-organisms produce methane during the process. This creates 12% of natural methane emissions.

Oceans - Another significant natural source of methane comes from the oceans. Methane producing microbes living in the ocean create these emissions. This creates 10% of natural methane emissions. Globally, oceans create 19 million tons of methane per year.

SOURCE: whatsyourimpact.org

LANDFILLS

The average person discards 4.6 lbs of trash per day. Approximately 258 million tons (232 million metric tons) of trash, or solid waste, is generated in the United States each year [source: EPA]. Have you ever wondered where your foodservice packaging trash goes? Well, depending on the city you reside in, it's collected by three different trucks. One is a trash truck, the second is a recycling truck and the third is a green waste collection truck. Each collection company deposits it all at a material recovery facility where it is sorted for its end of life destination. In the past it used to be just one truck. That one truck deposited it all into a landfill. A landfill is a large property of land where garbage and waste materials are dumped into a vast hole that is covered over with protective layers that prevent seepage into ground water and allows for new habitats to emerge when it's completely full. However, landfills are expensive to manage and they have to operate without trapping the thousands of tons of methane and carbon dioxide gases that emit from below up into the ozone each year due to the trapped waste below cooking in an anerobic environment.

Due to the new directives set in place by many local city and county governments, waste is being rechanneled and diverted away from landfills.

Today, although landfill gases are a significant contributor to the depletion of our ozone (landfills produce a total of 18% of all U.S. Green House Gases or GHG), new cutting-edge technologies are allowing landfill operations to minimize the escaping landfill gases and even trap or capture the emissions, which are then converted into electric power. Although landfills serve a purpose for our waste volumes today many states, like in California, have new mandates to achieve zero waste by rechannelling all of the waste away from landfills through expanded recycling and compost collection programs.

It is estimated that in 2023, around 55 million tons of plastic were discarded in North America. On average, only 6-7% of it is actually recycled and just 7% of it is combusted in energy facilities which create electricity or heat from garbage. As a result, the rest of it, or around 47 million tons of plastic, ends up in landfill.

LAYERS OF A LANDFILL

- Ground water
- Compacted clay
- Plastic liner
- Leachate Collection Pipe
- Geotextile Mat
- Gravel
- Drainage Layer
- Soil Layer
- Old Cells
- News Cells
- Leachate Pond

RECYCLING

The recycling programs throughout California have become so efficient that in some areas new local and county legislation have set goals to divert 75% of waste resources away from landfill and will strive to be at zero waste by 2040.

In order for many cities and states to implement and achieve a zero waste program they have to be able to divert the materials into their appropriate recycling and or composting streams. Diverting glass, aluminum, metals, paper, wood, corrugated boxes, yard trimmings, food and even plastic would allow waste disposal companies to cut down on their overall loads going into landfill. The following definitions may give you some insight on durable materials, end-of-life process that each of these materials cycle through after thrown away.

DURABLE MATERIAL CLASSIFICATIONS

MATERIAL NAME		RECYCLE	LANDFILL
	ALUMINUM MADE FROM THE INGOT	YES	NO
	WOOD MADE FROM TREES	YES	NO
	GLASS	YES	NO

ALUMINUM FOIL IS ACTUALLY GREENER THAN YOU THINK!

If you were using disposable containers back in the 1950's, 60's & 70's it was probably aluminum foil. Remember the original foil TV dinner tray? Foil continued to be a very widely used material in foodservice disposable container applications right up to the early 1990's when plastic containers began to replace foil as a cheaper option and because select grades of plastic performed better in a microwave. Well fast forward to today and believe it or not aluminum foil has made a strong comeback in the foodservice community. People are beginning to realize that aluminum foil is 100% recyclable. In fact, it's one of the most sought after post-consumer materials in the recycling waste stream. Aluminum foil can be melted down and used over and over again where plastics cannot be used more than twice. Foil is also a great insulating material that keeps hot food warm for longer periods of time than plastic. Today's microwaves will even accept foil, without arcing (sparks) if the foil is filled up with food and is not touching the walls of the microwave. Foil won't crack, it's freezer safe and it can typically withstand oven temperatures up to 500 F. Due to the high demand for foil in the post-consumer marketplace, most foil cans, sheets and containers stay out of landfill, the compost pile and end up in recycling streams that find its way back to being melted down and used again. Aluminum foil is actually "Greener" than you think!

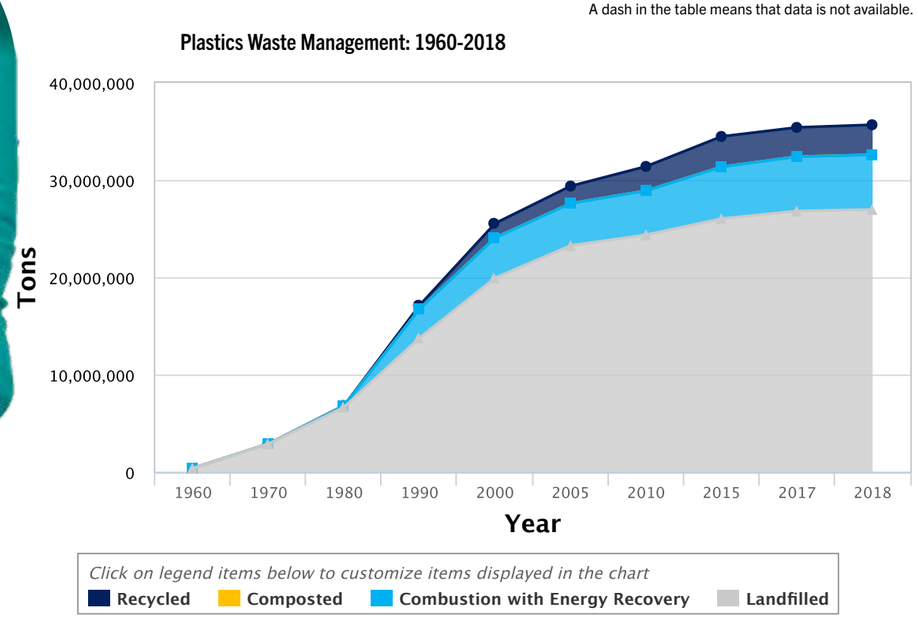
PLASTICS TABLE AND GRAPH

The data below are from 1960 to 2018, relating to the total number of tons of plastics generated, recycled, combusted with energy recovery and landfilled.

1960-2018 Data on Plastics in MSW by Weight (in thousands of U.S. tons)

Management Pathway	1960	1970	1980	1990	2000	2005	2010	2015	2017	2018
Generation	390	2,900	6,830	17,130	25,550	29,380	31,400	34,480	35,410	35,680
Recycled	-	-	20	370	1,480	1,780	2,500	3,120	3,000	3,090
Composted	-	-	-	-	-	-	-	-	-	-
Combustion with Energy Recovery	-	-	140	2,980	4,120	4,330	4,530	5,330	5,590	5,620
Landfilled	390	2,900	6,670	13,780	19,950	23,270	24,370	26,030	26,820	26,970

A dash in the table means that data is not available.



Sources: "Plastics: Material-Specific Data | US EPA." US EPA, www.epa.gov, 12 Sept. 2017, https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/plastics-material-specific-data#PlasticsTableandGraph.

WHAT IS WISH CYCLING?

When you place a plastic bottle into your home recycling bin does it make you feel good like you are doing something right for the environment? People may not be sure the system works, but they choose to believe that if they recycle an object, it will become a new product rather than become buried in a landfill, burned, or dumped. Well, the truth is not what you probably want to hear.

According to the latest US EPA data from 2018, 35.7 million tons of plastics were produced in the United States, but only 8.7% were recycled. There are many factors and complexities that explain the challenges with recycling plastics. One challenge is the lack of standardization of plastic types used in the manufacturing process. Different plastic types have different melting points, depending on the manufacturing process. Chemicals are also added into plastics to give them specific characteristics such as more flexibility, or more rigidity. The result is thousands of different variations of plastics. Not all plastic types are recyclable and those types that are recyclable need to be separated from the types that are not. The process of collecting, sorting, cleaning, and preparing plastics for recycling is labor intensive and costly. Comparatively, virgin plastics are often cheaper to source for manufacturers than recycled plastics. Ultimately, recycling is a market driven system—there needs to be demand for recycled content material for plastic to be recycled and the demand needs to be great enough to warrant the effort/ investment that goes into the recycling process. Consequently, the recycling of many plastics is not economically feasible resulting in greater disposal.

The U.S. recycling industry was launched in the 1970s in response to public concern over litter and waste. The growth of recycling and collection programs changed consumers' view of waste: It didn't seem entirely bad if it could lead to the creation of new products via recycling. Pro-recycling messaging from governments, corporations, and environmentalists promoted and reinforced recycling behavior. This was especially true for almost all grades of plastics that began to emboss, at the bottom of the package, a resin identification code inside a triangle of "chasing arrows," indicating that the item was recyclable — even though that was usually far from the truth. Surprisingly only resins #1 (polyethylene terephthalate, or PET) and #2 (high-density polyethylene, or HDPE) are recycled. The reason is because these two grades of plastics have viable after-life markets. The others (# 3-7) are hard to recycle, meaning there is no after-life market demand and so some jurisdictions don't even collect them. The reason plastics grades # 3-7 are difficult to recycle is because many of these plastics have blends of other materials inside of their composition like talc, which is often used as a filler to extend the use of plastic during production runs. As a result, these grades of plastics are not useful because if they are ground up and melted, in an effort to use them again, many of these plastic compounds have heat viscosities that won't allow the manufacturer to mold the plastic resin back into the form of a new product.

However, there are manufacturers that are blending all of these grades of plastics into products like school playground material which is encouraging but again limited in the overall use.

"Wishcycling" entered public consciousness in the U.S. around 2018 when China implemented new national laws that they called "Operation National Sword". This was a sweeping set of restrictions on imports, of most waste materials from abroad, that included all grades of plastics and cardboard. Over the preceding 20 years, China had bought millions of tons of scrap metal, paper and plastic from wealthy nations for recycling, giving those countries an easy and cheap option for managing waste materials.

The China scrap restrictions created enormous waste backups in the United States, where local city, county and state governments had underinvested in recycling systems. Consumers saw that recycling was not as reliable or environmentally friendly as previously believed. An unlikely coalition of actors in the recycling sector coined the term "wishcycling" in an effort to educate the public about effective recycling. Wishcycling can be harmful. Contaminating the waste stream with material that is not actually recyclable makes the sorting process more costly because it requires extra labor. Wishcycling also damages sorting systems and equipment and depresses an already fragile trading market.

Huge waste management companies and small cities and towns have launched educational campaigns on this issue. Their mantra is "When in doubt, throw it out." In other words, place only material that truly can be recycled in your bin. This message is hard for many environmentalists to hear, but it cuts costs for recyclers and local governments.

We also believe it's important to understand that the global waste crisis wasn't created by consumers who failed to wash mayonnaise jars or separate out plastic bags. The biggest drivers are global. They include reliance on consumption, strong international waste trade incentives, a lack of standardized recycling policies and the devaluation of used resources. To make further progress, governments and businesses will have to think more about making massive investments in recycling infrastructure.

CO-AUTHORS: Jessica Heiges is a PhD candidate in environmental science, policy, and management at the University of California at Berkeley. Kate O'Neill is professor of global environmental politics at the University of California at Berkeley.

This article was originally published on theconversation.com but has also been co-authored and edited by Chris Matson – President of Nexus.

HOW MUCH DO AMERICANS THROW AWAY?

- Americans represent 5% of the world's population, but generate 30% of the world's garbage.
- In the U.S. industry moves, mines, extracts, shovels, burns, wastes, pumps and disposes of 4 million pounds of material in order to provide one average middle-class American family's needs for one year.
- In sum, Americans waste or cause to be wasted nearly 1 million pounds of materials per person every year. This figure includes 3.5 billion pounds of carpet landfilled, 3.3 trillion pounds of CO2 gas emitted into the atmosphere, 19 billion pounds of polystyrene peanuts, 28 billion pounds of food discarded, 360 billion pounds of organic and inorganic chemicals used for manufacturing, 710 billion pounds of hazardous waste and 3.7 trillion pounds of construction debris.
- If wastewater is factored in, the total annual flow of waste in the American Industrial system is 250 trillion pounds.
- Less than 2% of the total waste stream in the United States is recycled.
- For all the world to live as an American we would need two more Earths; three more if the population should double and twelve Earth's altogether if worldwide standards of living doubled in the next forty years.

To put it another way…

- Americans throw away enough garbage everyday to fill 63,000 garbage trucks, which if lined up end to end for an entire year would stretch half way to the moon.
- In a lifetime, the average American will personally throw away 600 times his or her body weight, which for an average adult would leave a legacy of 90,000 pounds of trash at the end of their lifetime.
- Of the garbage Americans throw out, half could be recycled, which is enough to fill a football stadium from top to bottom everyday.
- Of these recyclables, Americans throw away enough aluminum to rebuild the entire commercial air fleet every three months, enough steel to reconstruct Manhattan, and enough wood to heat 5 million homes for 200 years.
- U.S. waste disposal costs exceed $100 billion annually.

WHY RECYCLE?

There are many reasons to recycle, but the short list includes:

- It saves money.
- It improves efficiency.
- It reduces energy use.
- It reduces fuel use.
- It saves landfill space.
- It improves air quality.
- It improves water quality.
- It reduces the rate of global warming.

FACTS ABOUT RECYCLING…

ALUMINUM

One ton of recycled Aluminum saves:

- 14,000 kWh of electricity.
- 1,663 gallons of oil.
- 237.6 million Btu's of energy.
- 10 cubic yards of landfill

Aluminum takes 200-500 years to fully degrade in a landfill Recycling aluminum takes 95% less energy than making aluminum from raw materials. Recycling one aluminum can saves enough energy to run a TV for three hours. There is no limit to the number of times aluminum cans be recycled. Recycled aluminum can be returned to store shelves in as little as 60 days.

About 120,000 aluminum cans are recycled every minute nationwide.

GLASS

One ton of recycled glass saves:

- 42 kWh of electricity.
- 714.3 Btu's of energy.
- 2 cubic yards of landfill space.
- 7.5 pounds of air pollutants from being released.
- 5 gallons of oil.
- 1,330 pounds of sand.
- 433 pounds of soda ash.
- 433 pounds of limestone.
- 151 pounds of feldspar.

Glass takes 1,000,000 years to fully degrade in a landfill Recycling glass takes 30% of the energy required to produce glass from raw materials. The United States throws away enough glass every week to fill a 1,350-foot building Recycling one glass bottle saves enough energy to light a 100-watt lightbulb for four hours. Glass never wears out and can be recycled forever.

PLASTIC

One ton of recycled plastic saves:

- 5,774 kWh of elecetricity.
- 685 gallons of oil.
- 98 million Btu's of energy.
- 30 cubic yards of landfill.

Plastic takes up to 1,000 years to degrade in a landfill Recycling plastic takes 88% less energy than making plastic from raw materials. Enough plastic is thrown away each year to circle the Earth four times. Americans throw away 35 billion plastic bottles every year. Only about 25% of the plastic produced in the U.S. is recycled. If we recycled the other 75% we could save 1 billion gallons of oil and 44 million cubic yards of landfill space annually.

Using aluminum or glass containers is always preferable over plastic. A plastic bottle of drinking water contains on average 4 cents worth of water. By using reusable drink containers an average person can eliminate the need for 100 disposable bottles per year.

PAPER

One ton of recycled paper saves:

- 4,100 kWh of electricity.
- 380 gallons of oil.
- 54 million Btu's of energy.
- 4.6 cubic yards of landfill space.
- 7,000 gallons of water.
- 17 trees

Recycling paper takes 60% less energy than making paper form raw materials. It also creates 74% less air pollution and 35% less water pollution. Americans throw away 4.5 million tons of office paper each year.That's enough to build a wall of paper 12 feet high from New York to Los Angeles. Every Sunday, 500,000 trees are used to produce the 88% of newspapers that are never recycled.

CARDBOARD

One ton of recycled cardboard saves:

- 390 kWh hours of electricity.
- 46 gallons of oil.
- 6.6 million Btu's of energy.
- 9 cubic yards of landfill space.

Cardboard and paper waste make up 41% of the municipal solid waste stream. Recycling cardboard takes 24% less energy and produces 50% less sulfur dioxide than making cardboard from raw materials.

STEEL

One ton of recycled steel saves:

- 642 kWh of electricity.
- 76 gallons of oil.
- 10.9 million Btu's of energy.
- 4 cubic yards of landfill space.
- 2,500 pounds of iron ore.

Steel takes up to 100 years to fully degrade in a landfill Recycling steel takes 25% less energy and creates only 25% the water and air pollution required to produce steel from raw materials. About 70% of all metal is used just once, then discarded. The remaining 30% is recycled, but after 5-cycles only 0.25% remains in circulation. The

INTERNATIONAL RECYCLING MARKETS

In North America we are challenged with the limitations on where and who we can send our various recycled grades of packaging substrates to given that there is no infrastructure set up to receive it. This is because there is no demand for many of these plastic substrates primarily grades #2 – #7. To many, it may come as a surprise that the majority of the various grades of plastics that consumers and businesses deposit into their recycling cans do not get purchased and used again here in the United States. Although there are a select few recycling companies that do grind up plastics (ranging from #2 – #7 grades) and sell them to other companies to be used as second generation post consumer plastic. One new recycled plastic product that is being made is railroad ties. Most recycling yards and waste stations are either sending the plastic tonnage to landfill or packing it into commercial freight containers and selling it on the open international market for a price. Vietnam and Russia, as well as other countries in Europe, are willing to buy containers of post consumer plastic to grind up and use again to make electronics, fleece jackets, shoe laces and a variety of other consumer and industrial products. The remaining plastic tonnage that is not used is sometimes burned in factories to generate heat and/or energy which can lead to pollutants in the air. This has become a problem in countries in Asia where the government does not always impose strict air regulations on factory waste pollutants. **The only real grade of plastic that is heavily recycled here in the United States and sold again to domestic companies as a substrate to make other products is #1 PET, or clear virgin grade polyethylene terathylate, also known as water bottle plastic.** Recycling companies make money off of this particular grade of plastic because manufacturers who use it know it's pure and its molecular compound is useful as a second generation plastic, where other grades of plastic have too many unknown additives and blends of other grades of plastics which make them less useful as a second generation resin. Since there is no demand for these grades of plastics (# 2- # 7) in their afterlife the bulk of our recycling has been sold internationally to a variety of countries as noted above. However, new international guidelines stemming from past G2 summits are seeking to restrict the burning of plastics in order to reduce the carbon being emitted into the atmosphere. For example, the air quality in China has become so bad over the years that their government has set forth new mandates to convert coal plants over to a cleaner burning natural gas fuel to power their manufacturing plants.

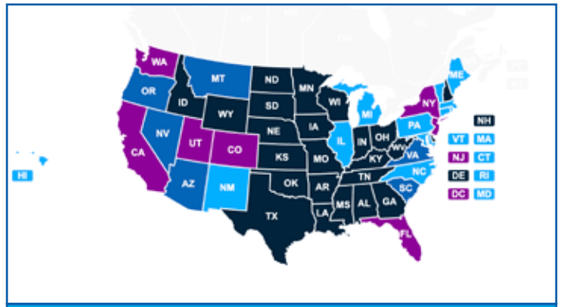
INTERNATIONAL PLASTIC IMPORTERS

The international demand for PCR, or post consumer recycled plastic, has stopped dramatically over the years. Vietnam and Europe fell behind China whose appetite for cheaper post consumer resin grew due to international demand for less expensive consumer products. That being said recent legislation, passed into law by the Chinese government to restrict air pollutants, has restricted the use of imported recycled plastics and even recycled paper. China's government set forth a new national initiative called "Operation Green Fence" or "National Sword" which has imposed strict air regulations on manufacturers, which has changed the landscape of the international market as a result China is no longer buying recycled plastic and or paper from countries in North America which has created a new problem for the United States as the tonnage of recycled plastic and paper has become a huge problem as there is now nowhere to send it.

GOVERNMENT REGULATIONS

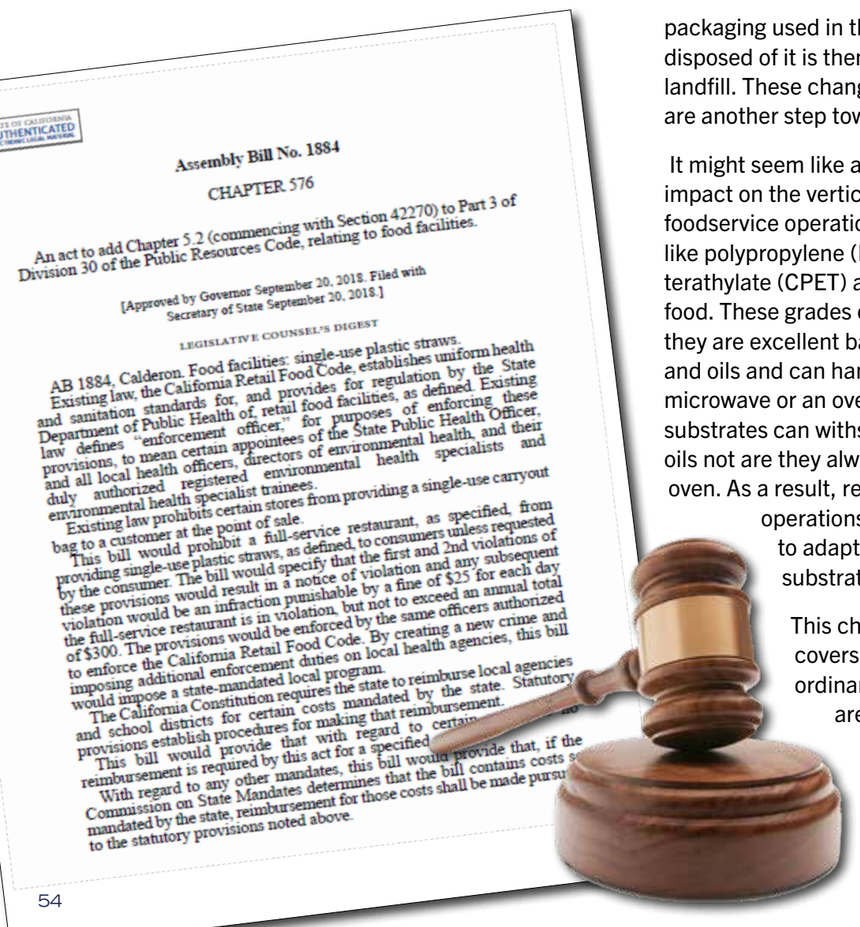
Government regulations, around the country, continue to evolve and change every year on a variety of different foodservice packaging substrates that have a huge impact on the vertical pipeline of supply.

Many local and state governments, especially in the Western United States, are trying to divert trash away from expensive landfills in an effort to achieve zero waste. In fact many cities and counties, within the state of California, have already passed legislation that has banned single use disposable plastics in foodservice operations. Other states, cities and counties are beginning to follow in their foot steps. As a result the old foam cup, the plastic grocery t-sack bag, clear, polystyrene clamshells and plastic cutlery are being replaced by new packaging substrates like bagasse pulp (recycled sugar cane reed stalk), paperboard and PLA (polylactic acid or corn) which are compostable substrates and are replacing plastic. Governments are using laws and ordinances to change the disposable takeout



MAP OF U.S. SHOWING ALL OF THE PLASTIC BANS BY STATE AND BY ORDINANCE

https://www.orbitz.com/blog/noplastics/?affcid=orbitz-US.network.cj.7598021.12852980&afflid=130107X1592158Xa07811d02bc3b500f5c64951de7aba48



Assembly Bill No. 1884

CHAPTER 576

An act to add Chapter 5.2 (commencing with Section 42270) to Part 3 of Division 30 of the Public Resources Code, relating to food facilities.

[Approved by Governor September 20, 2018. Filed with Secretary of State September 20, 2018.]

LEGISLATIVE COUNSEL'S DIGEST

AB 1884, Calderon. Food facilities: single-use plastic straws.

Existing law, the California Retail Food Code, establishes uniform health and sanitation standards for, and provides for regulation by the State Department of Public Health of, retail food facilities, as defined. Existing law defines "enforcement officer" for purposes of enforcing these provisions, to mean certain appointees of the State Public Health Officer, and all local health officers, directors of environmental health, and their duly authorized registered environmental health specialists and environmental health specialist trainees.

Existing law prohibits certain stores from providing a single-use carryout bag to a customer at the point of sale.

This bill would prohibit a full-service restaurant, as specified, from providing single-use plastic straws, as defined, to consumers unless requested by the consumer. The bill would specify that the first and 2nd violations of these provisions would result in a notice of violation and any subsequent violation would be an infraction punishable by a fine of $25 for each day the full-service restaurant is in violation, but not to exceed an annual total of $300. The provisions would be enforced by the same officers authorized to enforce the California Retail Food Code. By creating a new crime and imposing additional enforcement duties on local health agencies, this bill would impose a state-mandated local program.

The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that with regard to certain

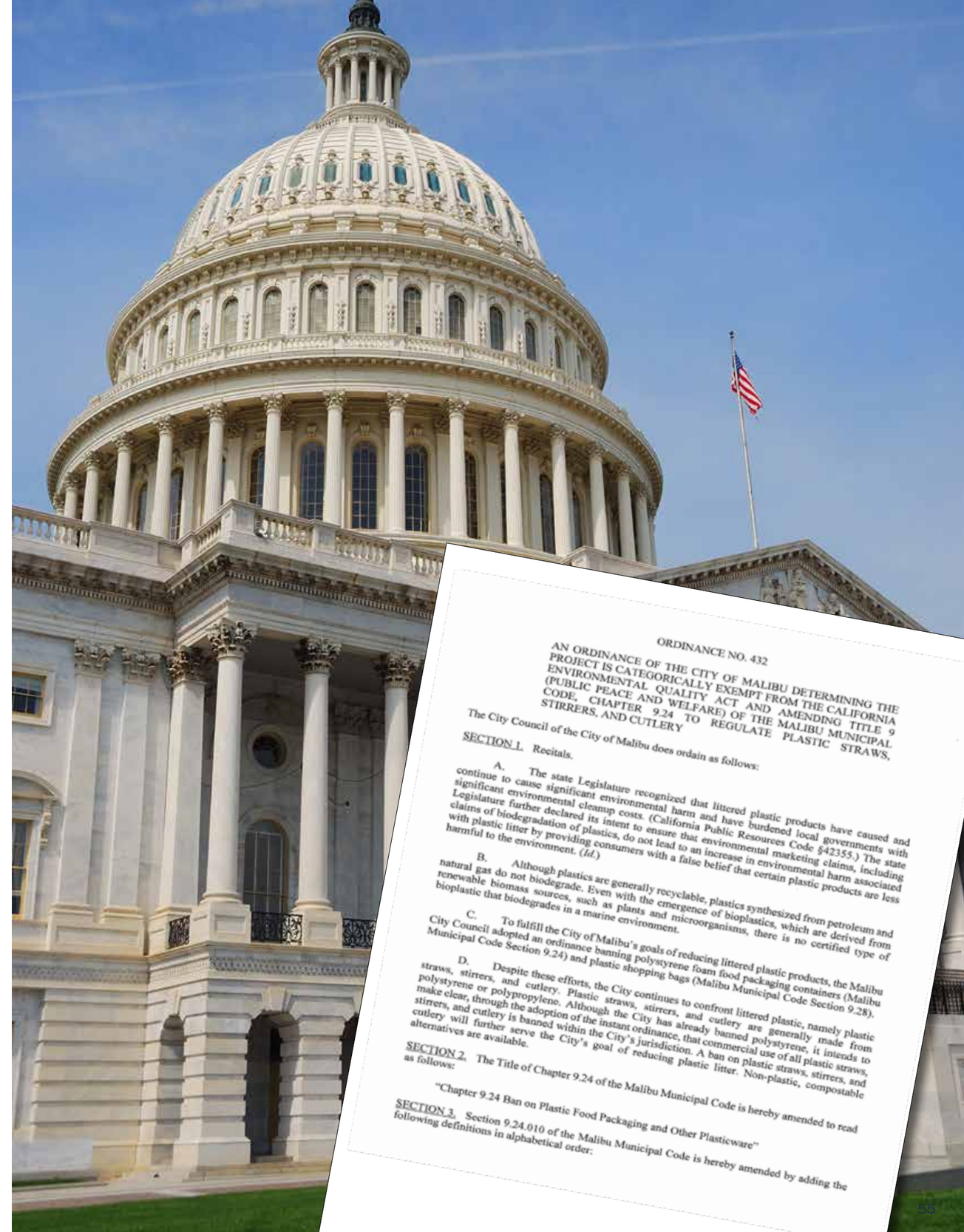
reimbursement is required by this act for a specified

With regard to any other mandates, this bill would provide that, if the Commission on State Mandates determines that the bill contains costs s mandated by the state, reimbursement for those costs shall be made pursu to the statutory provisions noted above.

packaging used in the food industry so that once it is disposed of it is then composted rather than sent to a landfill. These changes to food packaging substrates are another step towards achieving zero waste.

It might seem like a good idea but it does have a huge impact on the vertical pipeline of supply as well as on foodservice operations. For example, select plastics like polypropylene (PP) and crystallized polyethylene terathylate (CPET) are used specifically for hot takeout food. These grades of plastic are also used because they are excellent barriers to menu sauces, acids and oils and can handle the hot temperatures of a microwave or an oven. Not all grades of compostable substrates can withstand these hot sauces, acids and oils not are they always safe for the microwave or an oven. As a result, restaurants and other foodservice operations will have to adjust their menus to adapt the new compostable packaging substrates into their takeout program.

This chapter of Government Regulations covers all of the different new laws and ordinances, on single use plastics, that are either pending or have already become effective in many of the Western States. How will these new laws and ordinances impact your operation?



ORDINANCE NO. 432

AN ORDINANCE OF THE CITY OF MALIBU DETERMINING THE PROJECT IS CATEGORICALLY EXEMPT FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT AND AMENDING TITLE 9 (PUBLIC PEACE AND WELFARE) OF THE MALIBU MUNICIPAL CODE, CHAPTER 9.24 TO REGULATE PLASTIC STRAWS, STIRRERS, AND CUTLERY

The City Council of the City of Malibu does ordain as follows:

SECTION 1. Recitals.

A. The state Legislature recognized that littered plastic products have caused and continue to cause significant environmental harm and have burdened local governments with significant environmental cleanup costs. (California Public Resources Code §42355.) The state Legislature further declared its intent to ensure that environmental marketing claims, including claims of biodegradation of plastics, do not lead to an increase in environmental harm associated with plastic litter by providing consumers with a false belief that certain plastic products are less harmful to the environment. (*Id.*)

B. Although plastics are generally recyclable, plastics synthesized from petroleum and natural gas do not biodegrade. Even with the emergence of bioplastics, which are derived from renewable biomass sources, such as plants and microorganisms, there is no certified type of bioplastic that biodegrades in a marine environment.

C. To fulfill the City of Malibu's goals of reducing littered plastic products, the Malibu City Council adopted an ordinance banning polystyrene foam food packaging containers (Malibu Municipal Code Section 9.24) and plastic shopping bags (Malibu Municipal Code Section 9.28).

D. Despite these efforts, the City continues to confront littered plastic, namely plastic straws, stirrers, and cutlery. Plastic straws, stirrers, and cutlery are generally made from polystyrene or polypropylene. Although the City has already banned polystyrene, it intends to make clear, through the adoption of the instant ordinance, that commercial use of all plastic straws, stirrers, and cutlery is banned within the City's jurisdiction. A ban on plastic straws, stirrers, and cutlery will further serve the City's goal of reducing plastic litter. Non-plastic, compostable alternatives are available.

SECTION 2. The Title of Chapter 9.24 of the Malibu Municipal Code is hereby amended to read as follows:

"Chapter 9.24 Ban on Plastic Food Packaging and Other Plasticware"

SECTION 3. Section 9.24.010 of the Malibu Municipal Code is hereby amended by adding the following definitions in alphabetical order:

PLASTIC STRAW ORDINANCES

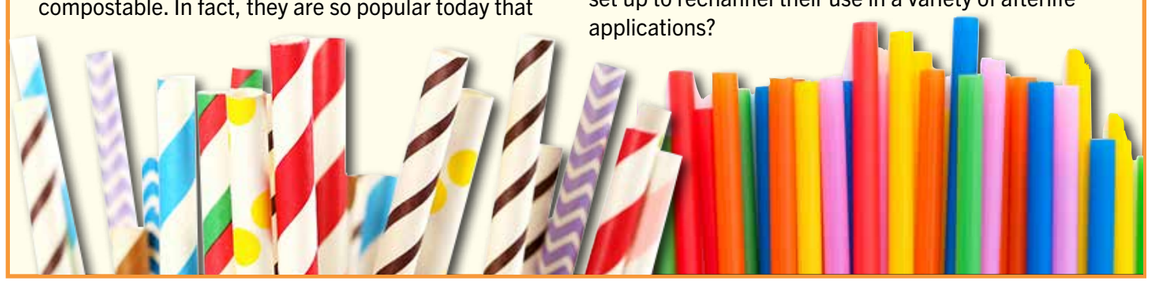
GOVERNMENT ORDINANCES

In July of 2018 the city of **Seattle** banned plastic straws. Since that time several other cities across the U.S. like **New York City**, **New Jersey**, **Miami Beach** and especially in California where the use of plastic straws in any public foodservice establishment are prohibited in cities like: **Alameda**, **Carmel**, **San Luis Obispo**, **Davis**, **Santa Barbara**, **Malibu**, **Santa Monica**, **Manhattan Beach**, **Oakland**, **Richmond** and **Berkeley**. **California Assembly Bill 1884**—prohibits restaurants in California from giving out plastic straws to patrons unless they request the straws. Restaurants are encouraged, but not mandated by law, to use a compostable straw for drinks. This bill is tied to the earlier legislation passed in the California State Assembly back in 2014 to go to zero waste by the year 2040.

So why is a plastic straw such a bad thing? If you have not already seen the viral video of a plastic straw being pulled from the nose of a sea turtle it's enough to make you dislike plastic straws. That video, along with countless environmental groups pushed legislators to pass a ban on plastic straws to keep them off of the public beaches, out of the waterways and the ocean.

As a result of this ban paper straws have become very popular because they are both recyclable and compostable. In fact, they are so popular today that most manufacturers cannot even keep up with the demand to fill the void. Many restaurants, who are unable to source paper straws due to their increasing demand, have elected to go straw free and only giving out straws to their patrons when requested.

The ban on plastic straws was a surprise to many consumers who have, for decades, enjoyed plastic straws in a variety of drink applications like coffee, slurpies, sodas, cocktails, shakes and teas. However, in an effort to clean up the beaches and redirect waste away from landfills legislatures in a dozen or so states have passed bills limiting or in some cases banning plastic straws entirely. In some cities like Santa Barbara they have handed out tickets for excessive use of plastic straws in several foodservice establishments. **In the end we cycle back to the same problem we as consumers face in that it's not the plastic straws fault that it ends up in the oceans. Is it perhaps the fault of our society in that we do not have a dedicated waste collection and recycling program to channel these unique plastics?** For example, if plastic straws had a recycling stream that led to a market where they could be used in other products there would be no need to ban them. After all paper straws cost three times as much as plastic straws and you have to cut a tree down to make them. Is plastic really that bad or is our society just not set up to rechannel their use in a variety of afterlife applications?



GOVERNMENT REGULATIONS – ALASKA

ALASKA – PLASTIC BAG ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Anchorage, AK	Sep 15, 2019	ALL (Foodservice, Retail & Grocery)	Ban	Gauge not specified	Municipal Code 15.95.20: A retail seller shall not provide a plastic shopping bag to a purchaser to carry away goods purchased from, or serviced by, the retail seller	Chapter 15.95
Bethel, AK #2	Sep 1, 2010	ALL (Foodservice, Retail & Grocery)	Ban	Gauge not specified	Municipal Code 8.12.020: Affected retail establishments, food vendors and nonprofit vendors are prohibited from providing plastic carry-out bags to their customers at the point of sale to transport purchased items. It bans polystyrene (Styrofoam) from food service as well. City reported in 2019 that ban is not currently enforced.	Chapter 8.12
Cordova, AK	Oct 1, 2016	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Municipal Code 8.37.020: Plastic carry-out bag that is not intended nor suitable for continuous reuse and that is less than 2.25 mils thick.	Title 8, Chapter 8.37 (Ordinance #1137)
Dillingham, AK	2020	ALL (Foodservice, Retail & Grocery)	Ban	Gauge not specified	Municipal Code 8.04.120: No affected retail establishment may provide a new single-use plastic disposable shopping bag for the purpose of carrying away goods from the point of sale. No person may distribute single-use plastic disposable shopping bags at any city facility or any event held on city property.	
Galena, AK	1998	ALL (Foodservice, Retail & Grocery)	Ban	Gauge not specified	Municipal Code 13.04.045: Plastic bags, used for carry out, in retail business shall be prohibited.	
Haines, AK	Jan 1, 2020	ALL (Foodservice, Retail & Grocery)	Ban	Gauge not specified	Municipal Code 8.10.010: It shall be unlawful for all establishments in the borough to provide single-use, noncompostable plastic shopping bags for the purpose of carrying away goods from the point of sale.	19-04-536
Homer, AK	Jan 1, 2020	ALL (Foodservice, Retail & Grocery)	Ban	2.5 mils	Municipal Code 5.42.030: No seller may provide to a buyer any single-use plastic carryout bag for the purpose of carrying a buyer's purchased goods from the seller's premises.	Chapter 5.42
Hooper Bay, AK	Sep 1, 2010	ALL (Foodservice, Retail & Grocery)	Ban	No plastic film allowed		
Kodiak, AK	Apr 22, 2018	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Municipal Code 7.32.050: Disposable plastic shopping bag that is not suitable for repeated reuse, if made of or containing plastic that is less than 4 mils thick.	Ordinance 1372
McGrath, AK	Unknown	Unknown	Ban	Gauge not specified	Details unknown. City administrator confirmed a city resolution is in place banning plastic bags.	
Mountain Village, AK	Unknown	Unknown	Ban	Gauge not specified	Details unknown. City manager confirmed a plastic bag ban is in place.	
Palmer, AK	Jan 1, 2019	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Ban suspended for the duration of the state's Covid-19 emergency order.	Chapter 8.09
Saint Paul, AK	2002	Unknown	Ban	Gauge not specified	Resolution 2002-14 bans plastic bags.	
Seward, AK	Oct 1, 2018	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Municipal Code 9.35.015: Affected retail establishments, food vendors and nonprofit vendors are prohibited from providing plastic carry-out bags to their customers at the point of sale to transport purchased items. No person shall distribute plastic carry-out bags at any city facility or any event held on city property. It bans polystyrene (Styrofoam) from food service as well.	2018-007
Soldotna, AK	Nov 1, 2018	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Municipal Code 8.06.030: Single-use plastic bags that is neither intended nor suitable for continuous reuse and that is less than 2.25 mils thick.	Ordinance 2019-013
Unalaska, AK	Jan 1, 2019	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Municipal Code 11.16.040: Disposable plastic shopping bag that is not suitable for repeated reuse if made of or containing plastic that is less than 4 mils thick.	Chapter 11.16.040 (Ordinance #2018-09)
Wasilla, AK	Jul 1, 2018	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Municipal Code 9.44: Prohibits all establishments in city limits from providing single-use plastic disposable shopping bags for the purpose of carrying away goods from the point of sale. Allows establishments to provide carryout bags made of plastic 2.25 mil or thicker, with or without charge at their discretion.	Chapter 9.44

ALASKA – SINGLE-USE PLASTIC ORDINANCES

Jurisdiction	Enforcement Date	Restriction	URL
Homer, AK	Jan. 1, 2021	Banned the use of single-use plastic bags by retailers at checkout.	https://www.cityofhomer-ak.gov/citymanager/attention-homer-retailers-single-use-plastic-bag-ban-resumes-jan-1-2021#:~:text=Voters%20approved%20ballot%20Proposition%201,resume%20on%20January%201%2C%202021
Alaska	Jan. 1, 2021	Alaska's single use plastic bag municipal codes	https://dec.alaska.gov/eh/solid-waste/plastic-bag-bans/

GOVERNMENT REGULATIONS – ARIZONA

ARIZONA – PLASTIC BAG ORDINANCES

https://www.convenience.org/Media/Daily/2015/May/ND0504155

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Arizona (preemption)	Apr 13, 2015	ALL (Foodservice, Retail & Grocery)	Preemption			Arizona Revised Statutes, Title 11, Chapter 2, Article 4, Section 11-26-.13 (2015 SB 1241)
Bisbee, AZ #2	Nov 21, 2017	ALL (Foodservice, Retail & Grocery)	Voluntary ban	2.25 mils	Applies only to businesses that provide "consumer items ... for off-site use or consumption."	Chapter 9, Article 9.7 (Ordinance 0-17-15)

NEW COMPANY TURNS 100 TONS OF NON-RECYCLABLE PLASTIC INTO BUILDING BLOCKS FOR CONSTRUCTION

Recycling doesn't always mean chemically separating things into component parts, or finding a new life for an old object. An LA-based startup is proving that landfills need not be dug for plastics, if one can merely smash enough of them together into a Minecraft-like block.

103 tons of nonrecyclable plastics, in fact, have been diverted from entombment since the company was founded, all through ByFusion's patented machines known as "Blockers." Blockers have a simple yet ingenious design. They shred the plastic, and then apply mass multiplied by acceleration repeatedly, until the "nonrecyclable plastic" is so squished together that it fuses.

Composite plastics have advanced the world standard of living no end, but often they tend to be unrecyclable.

Many minds are trying to develop thermal or chemical methods of separating the polymers in these materials to allow them to be recycled. ByFusion have avoided this problem by cutting out that middleman and simply turning the material as is into a new, composite, and ridiculously durable construction block.

Called "ByBlocks," they are a simple 16x8x8 shape and can be used to build bus stops, fences, retaining walls, curtain walls, public terraces, and more.

ByFusion's full-service operation in LA can process 450 tons of plastic per year into blocks, and hope to install 12 more Blockers soon.

They have partnered with cities across the country, from the island of Kauai, to Boise in Idaho, to get as many blockers into the hands of people who want to use them.

A big advantage of the Blockers is their indiscrimination; they turn every kind of plastic, even fishing nets, into blocks of the same material properties. The only thing they can't tackle is polystyrene or Styrofoam.

Not one ounce of adhesive glue, mortar, or any kind of extra substance is used. If 22 pounds of plastic go in, a 22 pound block comes out.

The machines come in two sizes, one for industry, and another for community. The latter comes in a shipping container, while the former features an array of blockers for companies that really crank out the plastic waste.

Watch a durability comparison between the ByBlocks and classic, hollow cement blocks, and see the difference.[1]

1 Corbley, Andy. "New Company Turns 100 Tons of Non-Recyclable Plastic Into Building Blocks For Construction." Good News Network, www.goodnewsnetwork.org, 26 Jan. 2022, https://www.goodnewsnetwork.org/byfusion-turns-100-tons-of-nonrecyclable-plastic-into-building-blocks/.

GOVERNMENT REGULATIONS – CALIFORNIA

CALIFORNIA'S ZERO WASTE INITIATIVE - 2040

In California the state Assembly Bill (AB) 75 was passed in 1999 and the State Agency Model Integrated Waste Management Act took effect on Jan. 1, 2000. The act mandated that state agencies develop and implement an integrated waste management plan which outlines the steps to be taken to achieve the required waste diversion goals.

The current statutes require all state agencies and large state facilities to divert at least 50% of their solid waste from disposals facilities by Jan. 1, 2004. Legislation enacted in 2011 AB 341, made a legislative declaration that it is the policy goal, of the state of California, that not less than 75% of solid waste generated be source reduced, recycled, or composted by the year 2020.

In October of 2014, former Governor Brown signed AB 1826, requiring businesses, including State Agencies, to recycle their organic waste on and after April 1, 2016, depending on the amount of organic waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses, including State Agencies that meet the progressive thresholds.

In the end the final goal for California, along with now many other states in the Union, is to achieve zero waste by the year 2040 where all waste materials are either recycled and or composted and 100% of all waste is diverted away from landfills.

Zero Waste means diverting waste away from landfill from both businesses and from residential. It's the four Rs...

Reduce, Reuse, Recycle and Rot.

GOVERNMENT REGULATIONS – CALIFORNIA

CALIFORNIA – PLASTIC BAG ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
California (statewide)	1-Jul-15	Retail & Grocery	Ban	2.25 mils	Implementation was initially suspended until a 2016 referendum, which voters rejected. It was suspended again from Apr. 23 through June 22, 2020 due to the Covid-19 crisis.	Public Resources Code, Division 30, Chapter 5.3
California (statewide)	Jan 1, 2025	Retail & Grocery	Ban	2.25 mils	Adds restrictions on noncompostable and nonrecycled pre-checkout bags.	Public Resources Code, Division 30, Chapter 5.3, Section 42357
Alameda County, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Alameda, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Albany, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
American Canyon, CA	1-Jan-16	Retail & Grocery	Ban	2.25 mils	Was suspended (from 4/22/20 to 6/22/20) due to state's Executive Order N-54-20 because due to the Covid-19 crisis.	Title 5, Chapter 5.01 (Ordinance #2015-08)
Arcata, CA	1-Feb-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). No suspension happened during Covid	Title V, Chapter 3.5 (Ordinance #1434)
Arroyo Grande, CA	1-Sep-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Adopted as Ordinance 2012-1 of the San Luis Obispo County Integrated Waste Management Authority, on behalf of the seven cities in the county plus all unincorporated areas within the county. The IWMA is now considering a broader ban, which would extend the ban to cover restaurants.	Ordinance #2012-1
Atascadero, CA	1-Sep-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Adopted as Ordinance 2012-1 of the San Luis Obispo County Integrated Waste Management Authority, on behalf of the seven cities in the county plus all unincorporated areas within the county. The IWMA is now considering a broader ban, which would extend the ban to cover restaurants.	Ordinance #2012-1
Belmont, CA	22-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted San Mateo County Code by reference prior to 2015). Suspended until San Mateo County lifts Covid order.	Chapter 31, Article I
Belvedere, CA	1-Jan-15	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015)	Chapter 8.06 (Ordinance #2014-2)

CALIFORNIA – PLASTIC BAG ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Berkeley, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Berkeley, CA	Jul 1, 2023	Retail	Ban and Fee	No plastic film allowed	Also applies to pre-checkout bags, but only until 1/1/25, when state law prohibits them entirely. Applies to grocery stores only if >2,500 sq. ft. Applies to all retail stores not regulated by the state. Restaurant bag fee applies only to bags of leftovers from dine-in restaurants. 10-cent plastic bag fee applies only for bags deemed non-compostable, and does not apply in cases where a customer requests a pre-checkout bag to separate meat or seafood.	Chapter 11.62, as amended in 2016 and 2022
Beverly Hills, CA	1-Jul-14	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 6 months for small stores.	Article 5, Chapter 10 (Ordinance #14-0-2658)
Brisbane, CA	22-Apr-13	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.17 (Ordinance #580)
Burlingame, CA	22-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted San Mateo County Code by reference prior to 2015). Suspended until San Mateo County lifts Covid order.	Title 8, Chapter 8.12 (Ordinance #1883)
Calabasas, CA	1-Jul-11	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 6 months for small stores.	Title 8, Chapter 8.17 (Ordinance #2011-282)
Calistoga, CA	1-Jan-15	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 19, Chapter 19.12 (Ordinance #703)
Campbell, CA	27-Jan-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 6, Chapter 6.20 (Ordinance #2171 as amended by #2186)
Capitola, CA #2	1-Apr-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Chapter 5.48 (Ordinance #977)
Carlsbad, CA	Jul 1, 2023	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Appears to extend CA law, not prior city ordinance.	Ordinance CS-424
Carmel-by-the-Sea, CA	1-Feb-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.74 (Ordinance #2012-4)
Carpinteria, CA	1-Jul-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Initial implementation delayed 9 months for groceries only.	Title 8, Chapter 8.51 (Ordinance #655 as amended by #657)
Cathedral City, CA	1-Feb-16	Retail & Grocery	Ban	2.25 mils	Was suspended (from 4/22/20 to 6/22/20) due to state's Executive Order N-54-20 because due to the Covid-19 crisis.	Chapter 5.84 (Ordinance #2015-264)
Chico, CA	1-Jan-15	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Chapter 8.36.030 (Ordinance #2448)
Cloverdale, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Actually enacted as Ordinance 2014-02 of the Sonoma County Waste Management Agency serving Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma (city), Windsor and unincorporated areas in Sonoma County.	Sonoma County Waste Management Agency, Ordinance #2014-02
Colma, CA	22-Apr-13	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Bag fee increased from 10 to 25 cents on 1/1/2015.	Chapter 4, Subchapter 4.12
Corte Madera, CA	1-Sep-15	Retail & Grocery	Ban	2.25 mils	Was suspended (from 4/22/20 to 6/22/20) due to state's Executive Order N-54-20 because due to the Covid-19 crisis.	Title 6, Chapter 6.18 (Ordinance #949)
Cotati, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Actually enacted as Ordinance 2014-02 of the Sonoma County Waste Management Agency serving Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma (city), Windsor and unincorporated areas in Sonoma County.	Sonoma County Waste Management Agency, Ordinance #2014-02
Culver City, CA	28-Dec-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 11, Chapter 11.16 (Ordinance 2013-006)
Cupertino, CA	1-Oct-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 9, Chapter 9-17 (Ordinance #13-2102 as amended by #14-2122)
Daly City, CA	22-Apr-13	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.68 (Ordinance #1364)
Dana Point, CA	1-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 6, Chapter 6.47 (Ordinance #12-04)
Danville, CA	1-Jul-16	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Chapter VII, Section 7-7 (Ordinance #2014-11)
Davis, CA	1-Jul-14	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Chapter 32, Article 32.05 (Ordinance #2422 as amended by #2436)
Del Mar, CA	16-Nov-16	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Was suspended (from 4/22/20 to 6/22/20) due to state's Executive Order N-54-20 because due to the Covid-19 crisis. Original implementation delayed 6 mos. for foodservice only.	Title 11, Chapter 11.36 (Ordinance #915)
Desert Hot Springs, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.44 (Ordinance #543)
Dublin, CAw	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02

CALIFORNIA – PLASTIC BAG ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
East Palo Alto, CA	1-Oct-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 17, Chapter 17.05 (Ordinance #360)
El Cerrito, CA	1-Jan-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015)	Title 8, Chapter 8.22 (Ordinance #2013-03)
El Paso de Robles (Paso Robles), CA	1-Sep-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Adopted as Ordinance 2012-1 of the San Luis Obispo County Integrated Waste Management Authority, on behalf of the seven cities in the county plus all unincorporated areas within the county. The IWMA is now considering a broader ban, which would extend the ban to cover restaurants.	Ordinance #2012-1
Emeryville, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Encinitas, CA	1-Apr-15	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 11, Chapter 11.26 (Ordinance #2014-08)
Fairfax, CA	1-Nov-08	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Chapters 8.18 (Ordinance #722 as amended by #726), 8.19 (Ordinance #784) and 8.72.040 (Ordinance #838-2019)
Fort Bragg, CA	1-Dec-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 6, Chapter 6.26 (Ordinance #903-2012 as amended by #906-2013 and #912-2014)
Foster City, CA	22-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015)	Chapter 8.09 (Ordinance #571)
Fremont, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Glendale, CA	1-Jul-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 6 months for small stores.	Title 5, Chapter 5.74 (Ordinance #5790)
Gonzales, CA	1-Jan-15	Retail & Grocery	Ban	4.0 mils	Not preempted by state law (adopted prior to 2015).	title 5, Chapter 5.54 (Ordinance #2014-79)
Grass Valley, CA	1-Jan-15	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.17 (Ordinance #753)
Greenfield, CA	1-Feb-15	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.52 (Ordinance #505)
Grover Beach, CA	1-Sep-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Adopted as Ordinance 2012-1 of the San Luis Obispo County Integrated Waste Management Authority, on behalf of the seven cities in the county plus all unincorporated areas within the county. The IWMA is now considering a broader ban, which would extend the ban to cover restaurants.	Ordinance #2012-1
Half Moon Bay, CA	1-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 7, Chapter 7.35 (Ordinance #2013-03)
Hayward, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Healdsburg, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Actually enacted as Ordinance 2014-02 of the Sonoma County Waste Management Agency serving Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma (city), Windsor and unincorporated areas in Sonoma County.	Sonoma County Waste Management Agency, Ordinance #2014-02
Hercules, CA	1-Jan-15	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 5, Chapter 11 (Ordinance #480)
Hermosa Beach, CA	1-Apr-16	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted after Jan 2015).	Title 8, Chapter 8.68 (Ordinance #15-1356 as amended by #17-1377)
Indio, CA	1-Nov-14	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title IX, Chapter 103 (Ordinance #1653)
King City, CA	1-Jan-15	Retail & Grocery	Ban	4.0 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.39 (Ordinance #2014-711)
Lafayette, CA	1-Jul-15	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Lafayette Code of Ordinances Chap. 5-7 (Ord. No. 626, 4, Exhibit A)
Laguna Beach, CA	1-Jan-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 7, chapter 7.21 (Ordinance #1561)
Larkspur, CA	1-Nov-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 6, Chapter 6.18 (Ordinance #996 as amended by #1030)

CALIFORNIA – PLASTIC BAG ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Livermore, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Long Beach, CA	1-Aug-11	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 5 months for small stores.	Title 8, Chapter 8.62 (Ordinance #11-0009)
Los Altos, CA	1-Jul-13	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 6, Chapter 6.40 (Ordinance #2013-390 as amended by #2014-404)
Los Angeles County, CA	1-Jan-12	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 12, Chapter 12.85 (Ordinance #
Los Angeles, CA	1-Jan-14	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 6 months for small stores.	Chapter XIX, Article 2 (Ordinance #182604)
Los Angeles, CA	Jan 23, 2023	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (original ordinance adopted prior to 2015). Extends the city's existing ordinance relating to single-use plastic and paper bags to apparel and hardware stores, farmers' markets and open-air markets, and all food or beverage facilities. Not enforced until July 1 for stores with 26 or fewer employees. See https://bit.ly/LAbagDescription and https://bit.ly/LAbagFAQ.	Chapter XIX, Article 2.1 (Ordinance dated 10-27-22)
Los Angeles, CA	Jan 1, 2023	ALL (Foodservice, Retail & Grocery)	Ban	No plastic allowed	Applies only to city facilities and events on city property.	Los Angeles Administrative Code, Chapter 1, Division 10, Article 27 (Ordinance dated 10-6-22)
Los Gatos, CA	1-Feb-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Chapter 11, Article IV (Ordinance #2219)
Malibu, CA	27-Nov-08	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 6 months for small retailers only.	Title 9 Chapter 9.28 (Ordinance #323-2008 as amended by #325-2008 and #418-2017)
Manhattan Beach, CA	2-May-14	ALL (Foodservice, Retail & Grocery)	Ban	Gauge not specified	Not preempted by state law (adopted prior to 2015).	Title 5, Section 5.80 (Ordinance #19-0003, which repealed #14-0003 as amended by #18-0016)
Marin County, CA	1-Jan-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Applies only to unincorporated areas in the county.	Title 5, Chapter 5.46 (Ordinance #3553)
Marina, CA	19-Mar-15	Retail & Grocery	Ban	4.0 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.60 (Ordinance #2014-05)
Martinez, CA	18-Jun-14	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.23 (Ordinance #1381)
Mendocino County, CA	1-Jan-13	Foodservice & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 9, Chapter 9.41 (Ordinance #4297 as amended by #4325)
Menlo Park, CA	22-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 7, Chapter 7.10 (Ordinance #989)
Mill Valley, CA	20-Dec-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 7, Chapter 7.40 (Ordinance #1259 as amended by #1268)
Millbrae, CA	1-Sep-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 6, Chapter 6.05 (Ordinance #742)
Milpitas, CA	1-Jul-16	Retail & Grocery	Ban	2.25 mils	Was suspended (from 4/22/20 to 6/22/20) due to state's Executive Order N-54-20 because due to the Covid-19 crisis.	Title III, Chapter 5 (Ordinance #287)
Monrovia, CA	1-Jul-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 6 months for small stores.	Chapter 8.44
Monterey County, CA	27-Mar-15	Retail & Grocery	Ban	4.0 mils	Suspended indefinitely due to Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Applies only to unincorporated areas in the county. Bag fees (10 cents min.) originally delayed by 6 months. After 6 more months, the Board of Supervisors was authorized to raise the minimum bag fees up to a maximum of 25 cents (but this authority has not yet been used).	Title 10, Chapter 10.43 (Ordinance #5244)
Monterey, CA	1-Jun-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Paper-bag fee initially delayed for 6 months.	Chapter 14, Article 4, Sections 14-21 through 14-24 (Ordinance #3471)
Morgan Hill, CA	1-Apr-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.52 (Ordinance #2089 as amended by #2102 and #2276)
Morro Bay, CA	1-Sep-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Adopted as Ordinance 2012-1 of the San Luis Obispo County Integrated Waste Management Authority, on behalf of the seven cities in the county plus all unincorporated areas within the county. The IWMA is now considering a broader ban, which would extend the ban to cover restaurants.	Ordinance #2012-1
Mountain View, CA	1-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Chapter 16, Article IV (Ordinance # 10.12)
Napa County, CA	1-Jul-16	Retail & Grocery	Ban	2.25 mils	Was suspended (from 4/22/20 to 6/22/20) due to state's Executive Order N-54-20 because due to the Covid-19 crisis.	Title 5, Chapter 5.70 (Ordinance #1408)
Napa, CA	1-Aug-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 5, Chapter 5.65 (Ordinance #2014-10)

CALIFORNIA – PLASTIC BAG ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Nevada City, CA	1-Jul-15	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.34 (Ordinance #2014-03)
Newark, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02)
Novato, CA	18-Oct-14	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 6 months for grocery and convenience stores.	Chapter VII, Article 7-7 (Ordinance #1590)
Oakland, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Oceanside, CA	1-Jan-17	Retail & Grocery	Ban	2.25 mils	Was suspended (from 4/22/20 to 6/22/20) due to state's Executive Order N-54-20 because due to the Covid-19 crisis.	Chapter 13, Article IV (Ordinance #16-OR0592-1)
Oceanside, CA	Jan 1, 2025	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils		Chapter 13, Article IV
Ojai, CA	1-Jul-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 5, Chapter 13 (Ordinance #817)
Pacific Grove, CA	1-Mar-15	Retail & Grocery	Ban	4.0 mils	Not preempted by state law (adopted prior to 2015).	Title 11, Chapter 11.98 (Ordinance #14-015 as amended by #19-016)
Pacifica, CA	22-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 6, Chapter 5, Article 5 (Ordinance 792-C.S.)
Palm Desert, CA	1-Oct-15	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 5, Chapter 5.12 (Ordinance #1271A as amended by #1273 and #1291)
Palm Springs, CA	1-Nov-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 6, Chapter 6.09 (Ordinance #1849)
Palo Alto, CA	1-Jul-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	title 5, Chapter 5.35 (Ordinance #5194 as amended by #5473)
Pasadena, CA	1-Jul-12	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 6 months for small stores. (except foodmarts). The city council suspended the ordinance indefinitely due to the Covid-19 crisis, but lifted it on Aug. 24.	Title 8, Chapter 8.65 (Ordinance #7214)
Petaluma, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Actually enacted as Ordinance 2014-02 of the Sonoma County Waste Management Agency serving Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma (city), Windsor and unincorporated areas in Sonoma County.	Sonoma County Waste Management Agency, Ordinance #2014-02
Pico Rivera, CA	1-Jul-16	Retail & Grocery	Ban	2.25 mils	Enforcement initially delayed 6 months for convenience stores and small groceries.	Title 5, Chapter 5.74 (Ordinance #1088)
Piedmont, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Pismo Beach, CA	1-Sep-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Adopted as Ordinance 2012-1 of the San Luis Obispo County Integrated Waste Management Authority, on behalf of the seven cities in the county plus all unincorporated areas within the county. The IWMA is now considering a broader ban, which would extend the ban to cover restaurants.	Ordinance #2012-1
Pittsburg, CA	1-Jan-14	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). The original ordinance called for minimum bag fees to rise to 15¢ in 2016 and 25¢ in 2017, but the current law keeps it at 10¢.	Title 8, Chapter 8.07 (Ordinance #13-1377 as amended by #14-1385 and #18-1446)
Pleasant Hill, CA	4-Feb-15	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 9, Chapter 9.65 (Ordinance #883)
Pleasanton, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Portola Valley, CA	22-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted San Mateo County Code by reference prior to 2015). Suspended until San Mateo County lifts Covid order.	Title 8, Chapter 8.04.060 (Ordinance #2013-398)
Redwood City, CA	1-Oct-13	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Chapter 13, Article III (Ordinance #2393)
Richmond, CA	1-Jan-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Article IX, Chapter 9.14 (Ordinance# 1-13 N.S.)

CALIFORNIA – PLASTIC BAG ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Rohnert Park, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Actually enacted as Ordinance 2014-02 of the Sonoma County Waste Management Agency serving Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma (city), Windsor and unincorporated areas in Sonoma County.	Sonoma County Waste Management Agency, Ordinance #2014-02
Ross, CA	1-Apr-15	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Chapter 5.06 (Ordinance #656)
Sacramento County, CA	1-Jul-16	Retail & Grocery	Ban	2.25 mils		Title 6, Chapter 6.130 (Ordinance #SCC 1596)
Sacramento, CA	1-Jan-16	Retail & Grocery	Ban	2.25 mils		Title 5, Chapter 5.154 (Ordinance #2015-0007 as amended by #2015-0035)
Salinas, CA	26-Feb-15	Retail & Grocery	Ban	4.0 mils	Not preempted by state law (adopted prior to 2015).	Chapter 16, Article XII (Ordinance #2550(NCS))
San Anselmo, CA	1-Jan-15	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 5, Chapter 9 (Ordinance #1092 as amended by #1095)
San Bruno, CA	22-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Minimum bag fees were originally 10 cents, but increased to 25 cents on 1/1/15.	Title 10, Chapter 10.25 (Ordinance #1810)
San Carlos, CA	22-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Adopts by reference the San Mateo County ordinance.	Title 8, Chapter 8.28 (Ordinance #1455)
San Francisco, CA #4	1-Jul-20	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Customers temporarily barred from reusing bags during Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Ban does not apply to compostable bags, but they are subject to the minimum 10-cent fee. Was suspended until June 21, 2020 due to the COVID-19 crisis.	San Francisco Environment Code, Chapter 17 (Ordinance #81-07 as amended by #33-12, #6-17 and #172-19)
San Jose, CA	1-Jan-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Has a different definition of Retail. Was suspended, initially until Jun 21, 2020, due to the COVID-19 crisis. Paper-bag ban replaced a minimum $.10 fee as of 1/1/14.	Title 9, Chapter 9.10, Part 13 (Ordinance #28877 as amended by #29314)
San Leandro, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
San Luis Obispo County, CA	1-Oct-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Adopted as Ordinance 2012-1 of the San Luis Obispo County Integrated Waste Management Authority, on behalf of the seven cities in the county (Arroyo Grande, Atascadero El Paso de Robles a/k/a Paso Robles, Grover Beach, Morro Bay, Pismo Beach and the city of San Luis Obispo), plus all unincorporated areas within the county. The IWMA is now considering a broader ban, which would extend the ban to cover restaurants.	Ordinance #2012-1
San Luis Obispo, CA	1-Sep-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Adopted as Ordinance 2012-1 of the San Luis Obispo County Integrated Waste Management Authority, on behalf of the seven cities in the county plus all unincorporated areas within the county. The IWMA is now considering a broader ban, which would extend the ban to cover restaurants.	Ordinance #2012-1
San Mateo County, CA	22-Apr-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Suspended indefinitely due to Covid-19 crisis. Appears to apply to entire county, not just to unincorporated areas.	Title 4, Chapter 4.114 (Ordinance #4637)
San Mateo, CA	1-Oct-12	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 5, Chapter 5.86 (Ordinance #2013-7)
San Pablo, CA	1-Jan-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 5, Chapter 5.12 (Ordinance #2013-009)
San Rafael, CA	1-Sep-14	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 10, Chapter 10.94 (Ordinance #1920)
Santa Barbara, CA	1-Dec-14	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Chapter 16B (Ordinance #4931)

CALIFORNIA – PLASTIC BAG ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Santa Clara County, CA	1-Jan-12	Retail & Grocery	Ban	2.25 mils	Suspended due to Covid-19 crisis. Not preempted by state law (adopted prior to 2015).	Title B, Division B11, Chapter XVII (Ordinance #517.77)
Santa Clara, CA	1-Dec-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 13, Chapter 13.20, Article VI, Sections 13.20.190 through 13.20.210 (Ordinance #1930)
Santa Cruz County, CA	1-Mar-12	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Paper-bag fee (but not plastic-bag ban) suspended indefinitely on Aug. 4, 2020 amid a rise in new Covid-19 cases.	Title 5, Chapter 5.48 (Ordinance #5103 as amended by #5116, #5138, #5186 and #5291)
Santa Cruz, CA	1-Apr-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 6, Chapter 6.49 (Ordinance #2012-08)
Santa Monica, CA	1-Sep-11	Retail & Grocery	Ban	2.25 mils	Suspended by city until July 1 due to Covid-19 crisis. Not preempted by state law (adopted prior to 2015).	Article 5, Chapter 5.45 (Ordinance #2348)
Santa Rosa, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Actually enacted as Ordinance 2014-02 of the Sonoma County Waste Management Agency serving Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma (city), Windsor and unincorporated areas in Sonoma County.	Sonoma County Waste Management Agency, Ordinance #2014-02
Sausalito, CA	1-Mar-14	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 11, Chapter 11.30 (Ordinance #1216)
Seaside, CA	1-Sep-15	Retail & Grocery	Ban	4.0 mils	Not preempted by state law (adopted prior to 2015).	TIte 8, Chapter 8.62 (Ordinance #1017)
Sebastopol, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Actually enacted as Ordinance 2014-02 of the Sonoma County Waste Management Agency serving Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma (city), Windsor and unincorporated areas in Sonoma County.	Sonoma County Waste Management Agency, Ordinance #2014-02
Solana Beach, CA	1-Jun-12	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 5, Chapter 5.01 (Ordinance #435 as amended by #437)
Sonoma County, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Actually enacted as Ordinance 2014-02 of the Sonoma County Waste Management Agency serving Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma (city), Windsor and unincorporated areas in Sonoma County.	Sonoma County Waste Management Agency, Ordinance #2014-02
Sonoma, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Actually enacted as Ordinance 2014-02 of the Sonoma County Waste Management Agency serving Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma (city), Windsor and unincorporated areas in Sonoma County. Suspended until June 18, 2020 due to the Covid-19 crisis.	Sonoma County Waste Management Agency, Ordinance #2014-02
South Lake Tahoe, CA	1-Feb-14	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 4, Article VI (Ordinance #1061)
South Pasadena, CA	6-Oct-14	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 2 months for small stores.	Chapter 16, Article III (Ordinance #2269)
South San Francisco, CA	1-Apr-13	Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.64 (Ordinance #1459)
St. Helena, CA	1-Jan-15	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 8, Chapter 8.36 (Ordinance #2014-8)
Sunnyvale, CA	1-Jun-12	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 5, Chapter 5.38 (Ordinance #2965.11)
Tiburon, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title III, Chapter 10A (Ordinance #551)
Truckee, CA	1-Jun-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title VI, Chapter 6.03 (Ordinance #2013-05)
Ukiah, CA	1-Feb-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Division 5, Chapter 9, Article 2 (Ordinance #1135 as amended by #1147)
Union City, CA	1-Jan-13	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Actually enacted as Ordinance 2012-02 of the Alameda County Waste Management Agency (ACWMA). Was suspended until June 22 by ACWMA due to the Covid-19 crisis. Not preempted by state law (adopted prior to 2015). Original ban did not affect restaurants and many small retailers.	Alameda County Waste Management Authority Ordinance #2012-2, as amended by #2016-02
Walnut Creek, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015).	Title 5, Chapter 6 (Ordinance #2127)
Watsonville, CA	1-Jun-12	Retail & Grocery	Ban	4.0 mils	Not preempted by state law (adopted prior to 2015).	Chapter 6-7 (Ordinance #1284-12)
West Hollywood, CA	20-Feb-13	Retail & Grocery	Ban	2.25 mils	Not preempted by state law (adopted prior to 2015). Enforcement originally delayed 6 months for small stores.	Title 15, Article 3, Chapter 15.72 (Ordinance #12-898)
Windsor, CA	1-Sep-14	Retail & Grocery	Ban	2.25 mils	Actually enacted as Ordinance 2014-02 of the Sonoma County Waste Management Agency serving Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma (city), Windsor and unincorporated areas in Sonoma County.	Sonoma County Waste Management Agency, Ordinance #2014-02
Yountville, CA	1-Mar-16	Retail & Grocery	Ban	2.25 mils	Was suspended (from 4/22/20 to 6/22/20) due to state's Executive Order N-54-20 because due to the Covid-19 crisis.	Title 8, Chapter 8.06 (Ordinance #16-477)

CALIFORNIA – SINGLE-USE PLASTIC ORDINANCES

Name	Text	URL
California passes rigid plastic registration law	California's Rigid Plastic Packaging Container (RPPC) Program	https://www.calrecycle.ca.gov/plastics/rppc
Proposition 67/SB 270 - Single-Use Carryout Bag Ban	California passes Proposition 67 to ban all plastic bags	https://oag.ca.gov/consumers/bag-ban
California recycle rigid plastic container registration link		https://www.calrecycle.ca.gov/Plastics/RPPC/Certification/
California passes SB-343, environmental recycling advertising law	SB-343 – Environmental advertising: recycling symbol: recyclability: products and packaging.	https://ca.gov
California passes ban on plastic straws	AB-1276 – Single-use foodware accessories and standard condiments.	https://calrecycle.ca.gov/organics/slcp/collection/
California passes SB-1383	SB-1383 Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste: landfills.	https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB1383
California passes SB-54	SB 54 establishes a new extended producer responsibility (EPR) program to manage packaging and single-use plastic disposable packaging products across every sector of the economy.	https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB54 https://calrecycle.ca.gov/packaging/packaging-epr/
County of San Mateo – bans single use plastic packaging	Ord. No. 2021-3 – San Mateo Law Library < Reader (open.law)	https://open.law
Mailbu california bans plastic straws, utensils and expanded polystyrene (foam) packaging	Plastic and PLA straws and cutlery prohibited	https://www.malibucity.org/861/Plastic-Bans
State Law Bans all Single Use Plastics in Foodservice Operations on State Land	SB-1335 – Solid waste: food service packaging: state agencies, facilities, and property.	https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1335
Marin moves forward with ban on single-use plastic foodware		https://www.marinij.com/2022/04/19/marin-moves-forward-with-ban-on-single-use-plastic-foodware/
LA County Bans Single-Use Plastic for Restaurants, Food Trucks, Cafeterias	The ordinance mandates recyclable, compostable, and reusable foodwares.	https://www.treehugger.com/la-county-bans-single-use-plastic-restaurants-5268239
LA County Bans Single-Use Plastic, Styrofoam	L.A. City Council votes to ban Styrofoam, single-use plastics	https://ktla-com.cdn.ampproject.org/c/s/ktla.com/news/local-news/l-a-to-ditch-single-use-plastic-at-city-facilities-ban-styrofoam/amp/
LA County Municipal Code to regulate the use of disposable foodware accessories.	Ord. No. 187030 - An ordinance amending Article 3 of Chapter XIX of the Los Angeles Municipal Code to regulate the use of disposable foodware accessories.	https://www.lacitysan.org/cs/groups/public/documents/document/y250/mdy1/~edisp/cnt065360.pdf
Culver City, CA - Plastic Ban	Ban on plastic and PLA straws, stirrers, cups, bowls, plates, and clamshell containers.	https://www.culvercity.org/City-Hall/Reports-policies-local-laws/City-Ban-On-Polystyrene-Foodware https://www.culvercity.org/files/assets/public/documents/public-works/polystyrene/amending-tittle-5-of-ccmc-to-add-5.07-waste-reduction-regulations-and-to-repeal-11.18-polystyrene-regulations.pdf
Hermosa Beach, CA - Plastic Ban	Plastic and PLA straws and cutlery prohibited	https://www.hermosabeach.gov/home/showpublisheddocument/13013/637144980029700000
Long Beach, CA - Plastic Ban	Plastic and PLA straws prohibited	https://library.municode.com/ca/long_beach/codes/municipal_code?nodeId=TIT8HESA_CH8.63POFOPA
Monterey, CA - Plastic Ban	Plastic and PLA straws prohibited and plastic cutlery prohibited	https://monterey.municipal.codes/Code/14_Art3
Palm Springs, CA - Plastic Ban	Plastic and PLA straws banned and utensils, straws, stirrers, napkins upon request only. Jan 1 23 all plates, bowls, cups, clamshells, boxes, deli containers and other containers must be made of "certified Fiber-based Compostable materials".	https://www.palmspringsca.gov/services/sustainability-and-recycling/single-use-plastics
Redondo Beach, CA - Plastic Ban	Plastic and PLA straws and cutlery banned	https://www.redondo.org/civicax/filebank/blobdload.aspx?t=42454.37&BlobID=38441
San Francisco, CA - Plastic Ban	Ban on plastic and PLA straws and utensils. compostable foodware must be certified by BPI.	https://sfenvironment.org/reduceplastic / https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_environment/0-0-0-1454
Santa Barbara, CA - Plastic Ban	Plasic and PLA straw ban. Cutlery available upon request only.	https://www.santabarbaraca.gov/services/recycling/newsdetail.asp?NewsID=1606&TargetID=27
Santa Monica, CA - Plastic Ban	No plastic or PLA straws or utensils	https://www.smgov.net/departments/ose/business/content.aspx?id=4816
Union City, CA - Plastic Ban	Plastic and PLA straws are banned	https://www.unioncity.org/417/Food-Ware-Ordinance-2020

CALIFORNIA SB 54

SB 54 establishes a new extended producer responsibility (EPR) program to manage packaging and single-use plastic disposable packaging products across every sector of the economy. Producers will have to ensure that the plastic disposables they sell in California are recyclable or certified compostable. Essentially, Governor Newsome has signed into law a path to curb the high use of single use plastics in California by requiring manufacturers (not restaurants) to send in a report every year to the state that defines the total pounds of plastic they sold. SB54's main initiative is to ensure that all foodservice plastic disposable manufacturers, in the future, will only be allowed to sell plastics that are accepted as a recyclable plastic and or bio-based materials that are 100% certified compostable. The bill directs producers to create a Producer Responsibility Organization (PRO) and to implement an EPR program in which producers must design, fund, and operate a statewide program that properly collects and recycles or composts their discarded plastic products.

SB 54

Plastic Pollution Prevention and Packaging Producer Responsibility Act

California's Packaging Challenge

Nearly every consumer product comes wrapped in packaging.

Packaging is about 25% of waste landfilled in California.

To address packaging issues producers must reduce how much packaging they use and make sure it gets recycled.

The Most Sweeping Plastic Pollution Reduction Law in US

Senate Bill 54 (SB 54, Allen, Chapter 75, Statutes of 2022) established the Plastic Pollution Prevention and Packaging Producer Responsibility Act.

This law sets the first specific source reduction goals in US history, a critical step to build a circular, reuse economy.

Shifts Packaging Pollution Burden from Consumers to Producers

The legislation shifts the plastic pollution burden from consumers -- who currently pay for landfilling and pollution clean up -- to the plastics industry. It raises $5 billion from industry members over 10 years to help cut plastic pollution and support disadvantaged communities hurt most by the damage of plastic waste.

SB 54 Regulatory Requirements

This packaging reform law requires by 2032:

25% of Plastic Packaging Cut

65% of Single-Use Packaging Recycled

100% Packaging in California Recyclable

SB 54: CalRecycle Activities

		Recurring Activities
2023	July 1, 2023: Appoint Advisory Board Hold Informal Rulemaking Workshops & Engage with Stakeholders	
2024	Hold Informal Rulemaking Workshops & Engage with Stakeholders	• Publish list of recyclable and compostable materials in CA
2025	Establish baseline for Plastic Materials for Source Reduction Report to Legislature Promulgate regulation by January 1, 2025 Material Characterization Study published	• Publish list of recyclable and compostable materials in CA
2026	Review and approve producer responsibility organization (PRO) plans Publish covered material recycling rates CalRecycle and Advisory board consider	• Publish list of recyclable and compostable materials in CA
2027	Report to Legislature	• Publish list of recyclable and compostable materials in CA Review annual report Review of annual audits of PRO accounting books
2028	Publish materials characterization study Publish covered material recycling rates CalRecycle and Advisory board consider recycling rate adjustment	• Publish list of recyclable and compostable materials in CA Review annual report Review of annual audits of PRO accounting books
2029	Report to Legislature	• Publish list of recyclable and compostable materials in CA Review annual report Review of annual audits of PRO accounting books
2030	Publish materials characterization study Publish covered material recycling rates CalRecycle and Advisory board consider recycling rate adjustment	• Publish list of recyclable and compostable materials in CA Review annual report Review of annual audits of PRO accounting books
2031	Report to Legislature Review and approve PRO plans	• Publish list of recyclable and compostable materials in CA Review annual report Review of annual audits of PRO accounting books
2032	Material Characterization Studies published CalRecycle and Advisory board consider recycling rate adjustment	• Publish list of recyclable and compostable materials in CA Review annual report Review of annual audits of PRO accounting books
2033	Report to Legislature	• Publish list of recyclable and compostable materials in CA Review annual report Review of annual audits of PRO accounting books

CALIFORNIA SB1335

STATE LAW BANS ALL SINGLE USE PLASTICS IN FOODSERVICE OPERATIONS ON STATE LAND

In a ground-breaking law, California is taking a first step to reduce the amount of food service packaging thrown away and littered in the environment by requiring certain food service facilities to serve customers with packaging that is either reusable, recyclable, or compostable. **SB 1335** (Allen, Chapter 610, Statutes of 2018) ensures that food service packaging is compatible with the state's recycling and composting systems according to criteria developed by CalRecycle through the rule-making process. Implementation of SB 1335 will encourage improvements in packaging design to protect public health and wildlife, establish more take back and reusable options at state facilities, and reduce contamination of recycling and composting streams. Regulated entities include:

- Food service operations located in a state-owned facility (such as a cafeteria in a state agency building)
- Concessionaires on a state-owned property (such as a food vendor at a state park or beach)
- Businesses under contract to provide food service to a state agency to dispense prepared food (such as a business providing food to a state hospital)

SB 1335 requires CalRecycle to maintain a List of Approved Food Service Packaging (List), which includes products that meet the specified reusable, recyclable, or compostable criteria. Food service packaging products that must be approved include bowls, cups, plates, containers, and trays. However, mass-produced prepackaged food and beverage containers and single-use disposable items—such as straws, lids, plastic bags, and utensils—are exempt from the law. CalRecycle must review and evaluate the List at least once every five years to determine whether food service packaging items continue to meet the criteria. CalRecycle will remove a food service packaging item from the List if it determines that the item no longer meets the established criteria. CalRecycle may also remove an item from the List based on its potential to contribute to litter, public health, or wildlife impacts.

MARIN COUNTY BANS SINGLE USE PLASTIC

Taking it the extreme, Marin County bans all single-use plastics from restaurant use

KEY COMPONENTS OF THE REUSABLE FOODWARE ORDINANCE

The ordinance was adopted on May 10, 2022 and is in effect. Enforcement will begin on November 10, 2023.

1. This ordinance applies to all entities selling prepared food to the public in the County. This includes restaurants, grocery stores and delis, bakeries, carry-out, quick services, farmers markets, food trucks, and any other business with a health permit (excluding public and private schools).
2. All takeout disposable foodware must be natural-fiber compostable (no bio plastics).
   - Takeout foodware (e.g., plates, bowls, cups, trays) must be certified by the Biodegradable Products Institute (BPI). Takeout foodware accessories (e.g., utensils, straws, stirrers, condiment cups, tray liners, etc.) must be natural-fiber compostable and only available "upon request" or at takeout station.
   - Aluminum is allowed.
3. Reusable foodware and utensils must be used if a customer is dining in at a restaurant.
   - Dine-in customers must be served on reusable foodware (e.g., plates, bowls, cups, trays) and utensils.
   - Natural-fiber compostable accessories are allowed.
4. A $0.25 charge for disposable cups.
   - To be retained by the Food Vendor.
   - Charge must be itemized on customer receipt.
   - Exemptions for Cal Fresh/SNAP and WIC customers. 5. Garbage, Recycling, and Organics bins must be in front (for customers) and back of house (for employees) with graphic-rich signage.

The entire ordinance can be viewed here:
https://www.marincounty.org/depts/cd/divisions/environmental-health-services/reusable-foodware-ordinance.

Marin County Reusable Foodware Ordinance

Required Now (Enforcement begins November 2023)

8/28/23

NO - Disposable Foodware for DINE-IN

USE - Reusable Foodware, Utensils & Glasses for DINE-IN

NO - PLA Bio Based or Plastic Utensils or Straws for TAKE-OUT

USE - WOOD (no shiney finish) for and unlined paper based straws TAKE-OUT

CURRENTLY EXEMPT

NO - PLA Bio Based or Plastic Portion Cups for TAKE-OUT

NO LONGER EXEMPT JANUARY 2024

USE - Fiber (PFAS-free, Unlined) for TAKE-OUT

NO - PLA Bio Based or Plastic Containers for TAKE-OUT

USE - Fiber (PFAS-free, Unlined) or Aluminum, no clear lids for TAKE-OUT

NO - PLA Bio Based, Plastic or paper w/lining Ice Cream cups for TAKE-OUT

USE - Fiber (PFAS-free, Unlined), no clear lids for TAKE-OUT

COUNTY OF MARIN

1

Marin County Reusable Foodware Ordinance

Required Now (Enforcement begins November 2023)

$.25 Hot & Cold Disposable Cup Charge
Identify on receipts, menus, online ordering platforms and verbally over the phone.

NOTE: Customers that provide SNAP benefit card and disabled individuals are exempt from the charge

Take Only What You Need
Disposable Accessories only available upon request (State Law)

State Law & Ordinance Requires - All Food Vendors who provide solid waste containers for customer use, must provide separate receptacles for solid waste, recyclables, and organics. Jurisdiction shall provide color guidelines for receptacles as consistent with jurisdiction's waste hauler and state law.

PRODUCTS CURRENTLY EXEMPT
List will be updated January 2024.
*PRODUCTS SUBJECT TO BE REMOVED FROM EXEMPT LIST IN JANUARY 2024
Hot/Cold Cup (i.e., beverage or soup), Hot/Cold Cup Lid, Food Container Lid, *Clear Condiment To-Go Container, Rotisserie Dome Container, *Sandwich Wedge Container, *Sushi Tray, *Baked Goods Box, Bottle Juice/Clear Beverage Bottles (Only for beverages made on site)

INVITE CUSTOMERS TO BRING THEIR OWN CONTAINERS-
It is safe in Marin County - See CA Health & Safety Code 114121- Returnables, cleaning for refilling.

COUNTY OF MARIN

Marin County Reusable Foodware Ordinance

Best Practices for Deli Grab-n-Go

8/28/23

Currently Used - PLA Bio Based or Plastic

Best Practice - Fiber (PFAS-free, Unlined) Show DISPLAY w/clear lid, add-itional stock labeled for grab & go

Currently Used - PLA Bio Based or Plastic

Best Practice - Kraft Paper (PFAS-free, Unlined) Show DISPLAY w/clear lid, the stock labeled for grab and go

Currently Used - Black Microwavable Plastic

Best Practice - Aluminum w/paper lids. Can be recycled if clean

Currently Used - PLA Bio Based or Plastic

Best Practice - Reusable glass jars - Charge Fee for return

FOOD SERVICE WARE ORDINANCE

As part of implementing the City's Zero Waste Plan, the City Council adopted a Food Service Ware Ordinance to reduce the amount of single-use plastic waste and litter generated in Mountain View. These changes will take effect on January 1, 2023. Visit MountainView.gov/Foodware for more information.

☑ BEST: Reusable food service ware is recommended

- Reusable food service ware is encouraged, though not required. A free program is available to help businesses switch to reusables for dine-in service, resulting in potential cost savings.
- Food providers should accommodate customer-provided reusable cups (in accordance with Health and Safety Code regulations).
- Consider services that provide reusables for take-out operations.

☑ BETTER: Disposable food service ware must be compostable or aluminum

- Compostable natural fiber or recyclable aluminum required for all containers (plates, bowls, cups, wrappers, etc.). Fiber-based packaging may have a BPI certified compostable plastic lining.
- Straws, stirrers, toothpicks and food picks must be wood, paper or other natural fiber-based material.
- Compostable food service ware must be certified free of fluorinated chemicals (PFAS) by a City-approved third party.

☒ BANNED: Plastic is not allowed for most food service ware

- All food service ware (plates, bowls, cups, wrappers, containers) cannot be made from petroleum-based or compostable plastics.
- Straws, stirrers and toothpicks cannot be made from or packaged in plastic or compostable plastic, except plastic straws provided upon request to those with medical needs.
- Polystyrene foam food service ware remains prohibited.

What's the new Food Service Ware Ordinance's purpose?

1. Reduce the amount of landfilled waste from single-use plastics.
2. Protect the health of our community members.
3. Reduce plastic pollution in waterways and the ocean.

WHICH PLASTIC ITEMS ARE BANNED?

Single-use plastic items associated with food and beverage service, such as the following:

- **Food Service Ware:** any product food is served on or in, including cups, bowls, plates, trays, cartons, boxes, wrappers or liners and hinged containers (clamshells).
- **Certain Food Service Ware Accessories:** straws, stirrers, toothpicks and food picks.

WHICH BUSINESSES ARE IMPACTED?

The requirements apply to food providers offering prepared food that operate within Mountain View.

- **Food Provider:** Anyone with a valid health permit from the County of Santa Clara to distribute prepared food to the public. Examples include restaurants, fast food, coffee or juice shops, bakeries, mobile food trucks, catering operations and private schools.
- **Prepared Food:** Food or beverages prepared on-site using any cooking or food preparation technique (mixing, heating, blending, chopping, portioning, etc.).

ARE THERE EXEMPTIONS?

Prepackaged food is exempt. Food providers may request an exemption for specific food service ware items if they believe there is not an acceptable compliant alternative, or due to financial hardship or other exceptional circumstances.

Straws, stirrers, toothpicks and food picks cannot be made from or packaged in plastic, but plastic is allowed for all other accessory items.

NEW STATE LAW: SINGLE-USE ACCESSORIES ONLY ON REQUEST

In addition to the City's Ordinance, most food providers must comply with Assembly Bill 1276 as of January 1, 2022.

- Accessories (utensils, straws, condiments, stirrers) may only be provided if requested by the customer or in certain types of dispensers.
- Items must be offered individually and cannot be packaged together.
- Online/mobile ordering platforms must have an option to request each accessory item.

City of Mountain View

For more information:
MountainView.gov/Foodware
Recycle@MountainView.gov | 650-903-6311

COUNTY OF SAN MATEO

MODEL DISPOSABLE FOOD SERVICE WARE ORDINANCE SUMMARY

Updated January 2023

FOODWARE AWARE
REUSE. CHOOSE. REFUSE.

OFFICE OF SUSTAINABILITY
COUNTY OF SAN MATEO

For a Plastic-Free Future! Information for Food Facilities

The **County of San Mateo's Model Disposable Food Service Ware Ordinance** (Ordinance) aims to reduce waste in our environment and litter in our rivers and ocean, protect public health, and reduce our dependence on plastic. The Ordinance applies to food facilities that operate within the **unincorporated areas of San Mateo County** and **cities in the county** that adopt it.

USE REUSABLES!

Recommended: Use reusable instead of disposable foodware.

- Use reusables made from metal, ceramic, and glass for dine-in. **Free technical and financial assistance** is available to help you switch to reusables for dine-in!
- Encourage consumers to bring their own reusable to-go containers.
- Consider foodware services that provide reusables for dine-in and take-out operations.

CHOOSE FIBER-BASED!

Required: Use natural fiber-based, compostable materials (e.g., paper, sugarcane, bamboo, etc.).

- Required for disposable plates, bowls, cups, food trays/boats, clamshells, boxes, and other containers. These fiber items must be PFAS-free. Compostable plastic **lining (only)** is ok for above items, but must be approved by Biodegradable Products Institute, Compost Manufacturing Alliance, or another 3rd party approved by County.
- Required for the following disposable side items (a.k.a. accessories) and their packaging, if any: straws, stirrers, utensils, cocktail/toothpicks.

REFUSE PLASTIC!

Not Allowed: Use of plastic for most disposable foodware.

- Disposable foodware made from traditional plastic (petroleum-based) or compostable plastic (a.k.a. bioplastics, PLA, etc.) are not allowed.
- Polystyrene foodware (all #6 plastics and Styrofoam) is prohibited.
- Accessories must be distributed only upon request and/or at dispensers that dispense one item at a time. Refillable condiment dispensers are allowed.
- Accessories cannot be bundled.

What's the purpose of the Disposable Food Service Ware Ordinance?

1. Reduce single-use plastics and other foodware waste
2. Improve the health and safety of our community members
3. Keep our waterways clean and safe

Who will be affected?

This Ordinance will apply to **food facilities** that:

1. Operate within the **unincorporated areas** of San Mateo County and **cities in the county** that adopt the County of San Mateo's (County) Disposable Food Service Ware Ordinance (Ordinance); and
2. Provide **prepared food** to the general public.

Food Facility: In general, an entity that has a valid health permit with the County for distributing food and beverages to the public. Examples include, but are not limited to restaurants, mobile food trucks, temporary food facilities (e.g., street fairs, festivals, etc.), farmers' markets, catering operations, private schools, and other operations.

Prepared Food: A.k.a. ready-to-eat food. Food and beverage prepared on-site at the food facility using any cooking or food preparation technique (e.g., mixing, heating, blending, chopping, portioning, etc.).

For a list of jurisdictions in San Mateo County that have adopted the County's Ordinance, please visit: https://www.smcsustainability.org/food-ware#start-dates

What items will be affected?

Disposable foodware refers to one-time/limited-number-of-use items associated with food and beverages. This includes, but is not limited to bowls, plates, clamshells, cups, straws, utensils, napkins, stirrers, tooth/cocktail picks, condiment packets, cup sleeves, etc.

What's allowed?

1. Food facilities can only distribute disposable **accessories** like straws, stirrers, utensils, condiment packets, etc.: UPDATED
   - When requested by the consumer; and/or
   - With dispensers that distribute one item at a time.

   Food facilities can **offer** consumers disposable accessories **only** at drive-throughs and airports.

   Food facilities using online take-out food delivery services must provide options for customers to request each type of accessory (e.g., fork, straw, napkins, etc.) and condiment (e.g., ketchup, sugar, etc.).

   Food facilities can use refillable bulk dispensers for condiments.

2. The following disposable foodware must be made from **non-plastic, compostable, natural fiber-based** materials such as paper, sugarcane, wheat stalk/stem, wood, hay, etc.
   - **Four Accessories:** Straws, stirrers, utensils, cocktail/toothpicks (and if wrapped, their packaging).
   - **Larger Foodware:** Plates, bowls, cups, food trays/boats, clamshells, boxes, deli containers, and other containers. These items can be lined (**only**) with compostable plastic, but they must be approved by Biodegradable Products Institute (BPI), Compost Manufacturing Alliance (CMA), or another 3rd party approved by the County.
3. For all other disposable foodware not listed in #2 above, items accepted by the food facility's local recycling or composting programs must be used.

What's not allowed?

4. The "**Four Accessories**" and "**Larger Foodware**" listed in #2 above cannot be plastic, either traditional (petroleum-based) or compostable (a.k.a. bioplastics, PLA, etc.). Polystyrene foodware (all #6 plastics and Styrofoam) is also not allowed.
5. **Per- and poly-fluoroalkyl substances (PFAS)** are not allowed in the "**Larger Foodware**" listed in #2 above.

   NEW Starting on 1/1/23, the State will expand this requirement to **ALL** disposable foodware made of fiber, including accessories and food contact paper (e.g., wraps, bags, tray liners, etc.).
6. Disposable accessories cannot be bundled. They must be distributed individually as separate items (e.g., each fork, spoon, straw, condiment, etc.).
7. NEW Open containers/bins holding disposable accessories for consumers to grab-and-go are no longer allowed.

Exemptions to the Ordinance

- Disposable foodware made from aluminum and glass are allowed.
- Disposable plastic straws may be provided only upon request to consumers with medical needs. Healthcare facilities may distribute disposable plastic straws without a request from patients.

Additional city-specific requirements

Some cities in the county that adopted the County's Ordinance also included a few additional requirements for food facilities that operate in their jurisdictions.

HALF MOON BAY

- Beginning on June 1, 2023, reusable foodware are required for on-premises dining. UPDATED
- Disposable accessories must be provided **only** upon request.

DALY CITY

- Wherever practicable, food facilities must provide reusable foodware in place of disposable foodware.

PACIFICA

- Starting on 6/1/23, food facilities must use reusable foodware for dine-in, except for straws, stirrers, cocktail sticks/picks, toothpicks, napkins, wrappers, and liners so long as they are fiber-based, compostable.

For information on additional requirements of other cities in San Mateo County, please visit: https://www.smcsustainability.org/food-ware#start-dates

Enforcement and timeline

The **County's Office of Sustainability** will be enforcing the new requirements within unincorporated areas of San Mateo County and in cities that adopt the County's Ordinance.

The additional city-specific requirements summarized in the green textbox above will be enforced separately by the individual cities.

Please check the following website for **enforcement start dates** for jurisdictions in San Mateo County that have adopted the County's Ordinance:

https://www.smcsustainability.org/food-ware#start-dates

Resources for food facilities

- **Financial and technical assistance** to switch from disposable to **reusable** foodware.
- **Technical assistance** to help meet the new requirements.
- A **Purchasing Guide** with information on approved disposable foodware items and available vendors.
- Various **signage, window cling, and employee training guide** with information on the requirements.

All resources are available on the program website: https://www.smcsustainability.org/food-ware/facilities/

Questions?

www.smcsustainability.org/food-ware foodware@smcgov.org (888) 442-2666

PLASTIC DISPOSABLE PACKAGING BANS

In Northern California many cities and counties and already enacted their own local ordinances banning single use plastic disposable packaging in an effort to reach the Zero Waste initiative by the year 2040. The list below will identify precisely which cities are impacted and the dates upon which their ordinances become effective.

JURISDICTION	DATE ORDINANCE ADOPTED	ENFORCEMENT START DATE	REQUIREMENTS THAT DIFFER FROM THE COUNTY'S MODEL ORDINANCE
City of Half Moon Bay	October 6, 2020	July 9, 2021	(1) Wherever practicable, food facilities shall provide reusable foodware in place of disposable foodware. (2) Accessories such as straws, stirrers, cup spill plugs, condiment packets, utensils, napkins, etc. shall be provided only when requested by the consumer (only one option).
County of San Mateo (unincorporated areas only)	February 25, 2020	March 25, 2022	City's plastic ban ordinance is consistent with the Countys.
City of South San Francisco	March 25, 2020	March 25, 2022	City's plastic ban ordinance is consistent with the Countys.
City of Burlingame	May 4, 2020	March 25, 2022	City's plastic ban ordinance is consistent with the Countys.
Town of Atherton	June 17, 2020	March 25, 2022	City's plastic ban ordinance is consistent with the Countys.
City of Belmont	Nov 25, 2020	March 25, 2022	City's plastic ban ordinance is consistent with the Countys.
City of Millbrae	Feb 23, 2021	March 25, 2022	City's plastic ban ordinance is consistent with the Countys.
City of Brisbane	April 15, 2021	March 25, 2022	City's plastic ban ordinance is consistent with the Countys.
Town of Colma	July 14, 2021	March 25, 2022	City's plastic ban ordinance is consistent with the Countys.
Town of Hillsborough	Sept 13, 2021	March 25, 2022	City's plastic ban ordinance is consistent with the Countys.
City of San Mateo	Feb 1, 2021	October 1, 2022	Wherever practicable, food facilities shall provide reusable foodware in place of disposable foodware.
City of Daly City	Sept 13, 2021	October 1, 2022	City's plastic ban ordinance is consistent with the Countys.
City of San Bruno	Sept 14, 2021	October 1, 2022	City's plastic ban ordinance is consistent with the Countys.

BILL NUMBER	CALIFORNIA SB AND AB LAW DEFINITIONS	BILL STATUS	LINK
SB 54	Creates an EPR (Expanded Producer Responsibility) program for printed paper and plastic packaging and sets recycling rates and reductions for plastics	Signed by Governor	https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB54
SB 1335	Ensures that food service packaging is compatible with the state's recycling and composting systems according to criteria developed by Cal Recycle	Signed by Governor	
SB 38	Exempts certain manufacturers involved in container redemption programs from new state recycled content requirements	Signed by Governor	https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB38&firstNav=tracking
AB 2784	Specifies recycled content standards for thermoform plastic food containers	Vetoed by Governor	
AB 661	Updates the State Agency Buy Recycled Campaign with new recycled content standards for materials purchased by the state of California	Signed by Governor	
SB 1046	Bans plastic produce bags	Signed by Governor	
November Ballot	Bans all single use plastics throughout the state of California.	Removed from Ballot	
SB 677	California's Latex Glove Safety Law prohibits the use of latex gloves or utensils in all food service operations and retail food facilities.	Signed by Governor	https://www.cdph.ca.gov/Programs/CEH/DFDCS/CDPH%20Document%20Library/FDB/FoodSafetyProgram/RetailFood/LATEX%20BAN%20AT%20RETAIL%20FOOD%20FACILITIES.pdf

California Governor Approved PFAS Law Related to Food Packaging and Cookware

BUREAU VERITAS

Background

On October 5, 2021, the Governor of the State of California approved a bill related to perfluoroalkyl and polyfluoroalkyl substances (PFAS) in food packaging and cookware:

- Assembly Bill No. 1200: An act to add Chapter 15 (commencing with Section 109000) to Part 3 of Division 104 of the Health and Safety Code, relating to product safety.

Summary

Assembly Bill No. 1200: Chemicals of Concern in Food Packaging and Cookware. The new law has two parts:

Article 1: Plant-Based Food Packaging Containing PFAS

Beginning January 1, 2023, food packaging that contains regulated perfluoroalkyl and polyfluoroalkyl substances or PFAS cannot be distributed, sold, or offered for sale in the state.

The least toxic alternative must be used when replacing PFAS in food packaging.

Definitions per the new rule:

"Food packaging" means a nondurable package, packaging component, or food service ware that is intended to contain, serve, store, handle, protect, or market food, foodstuffs, or beverages, and is comprised, in substantial part, of paper, paperboard, or other materials originally derived from plant fibers. "Food packaging" includes food or beverage containers, take-out food containers, unit product boxes, liners, wrappers, serving vessels, eating utensils, straws, food boxes, and disposable plates, bowls, or trays.

"Perfluoroalkyl and polyfluoroalkyl substances" or "PFAS" means a class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom.

"Regulated perfluoroalkyl and polyfluoroalkyl substances or PFAS" means either of the following:

a. PFAS that a manufacturer has intentionally added to a product and that have a functional or technical effect in the product, including the PFAS components of intentionally added chemicals and PFAS that are intentional breakdown products of an added chemical that also have a functional or technical effect in the product.
b. The presence of PFAS in a product or product component at or above 100 parts per million, as measured in total organic fluorine.

Article 2. Chemical Disclosures for Cookware

Definitions per the new rule:

"Cookware" means durable houseware items that are used in homes and restaurants to prepare, dispense, or store food, foodstuffs, or beverages. "Cookware" includes pots, pans, skillets, grills, baking sheets, baking molds, trays, bowls, and cooking utensils.

"Designated list" means the list of chemicals identified as candidate chemicals that exhibit a hazard trait or an environmental or toxicological endpoint that meets the criteria specified in regulations adopted by the Department of Toxic Substances Control pursuant to Article 14 (commencing with Section 25251) of Chapter 6.5 of Division 20, and is published on the Department of Toxic Substances Control's internet website pursuant to those regulations.

"Product label" means a display of written, printed, or graphic material that appears on, or is affixed to, the exterior of a product, or its exterior container or wrapper that is visible to a consumer, if the product has an exterior container or wrapper.

Office of Governor
GAVIN NEWSOM

Governor Newsom Signs Legislation to Tackle Plastic Pollution, Promote a More Sustainable & Renewable Economy and Protect Californians from Toxic Chemicals

Published: Oct 05, 2021

Governor signs SB 343 banning the use of misleading recycling labels, additional measures to reduce single-use trash pollution and support recycling goals

AB 652 bans the use of toxic PFASs in products for children, AB 1200 prohibits their use in disposable food packaging

Governor's historic $15 billion climate package includes $270 million to promote a more circular economy that advances sustainability

SACRAMENTO — Taking action to combat plastic pollution and advance a more sustainable and renewable economy, Governor Gavin Newsom today signed a package of legislation designed to raise consumer awareness and industry accountability, complementing his bold $270 million investment to modernize recycling systems and promote a more circular economy as part of the California Comeback Plan's historic $15 billion climate package. The Governor also signed bills to protect Californians and the environment from harmful chemicals.

Among the measures signed today is SB 343 by Senator Ben Allen (D-Santa Monica), which requires products to meet benchmarks in order to be advertised or labeled as recyclable, helping consumers to clearly identify which products are recyclable in California.

"California's hallmark is solving problems through innovation, and we're harnessing that spirit to reduce the waste filling our landfills and generating harmful pollutants driving the climate crisis," said Governor Newsom. "With today's action and bold investments to transform our recycling systems, the state continues to lead the way to a more sustainable and resilient future for the planet and all our communities."

The Governor last month announced that the California Comeback Plan's $15 billion climate package — the largest such investment in state history — includes $270 million to support a circular economy that advances sustainability and helps reduce short-lived climate pollutants from the waste sector. To raise demand for recyclables and attract green industry to California, the package includes funding to support the work of CalRecycle's new Office of Innovation in Recycling and Remanufacturing. Additional funds will support organic waste infrastructure, food recovery efforts and composting, remanufacturing and recycling infrastructure, including investments in disadvantaged communities.

Governor Newsom today also signed AB 881 by Assemblymember Lorena Gonzalez (D-San Diego), which discourages practices resulting in exporting plastic that becomes waste and ensures that only exports of truly recycled plastics count toward state waste reduction and recycling metrics. SB 619 by Senator John Laird (D-Santa Cruz) provides local governments additional paths to meet the climate goals of California's Short-Lived Climate Pollutant law. AB 1311 by Assemblymember Jim Wood (D-Santa Rosa) allows more flexible operations for beverage container recycling centers to reduce overhead and increase redemption access statewide. And AB 1201 by Assemblymember Phil Ting (D-San Francisco) strengthens labeling requirements to ensure products labeled "compostable" are actually compostable and to keep harmful chemicals out of California's compost stream.

Perfluoroalkyl and polyfluoroalkyl substances (PFASs), often called "forever chemicals" because they don't break down in the environment, have been linked to serious health hazards and have been found in the bodies of almost every human studied. To further reduce exposure and increase awareness, the Governor signed AB 1200 by Assemblymember Philip Ting (D-San Francisco), which prohibits disposable food packaging from containing intentionally added PFASs and requires cookware manufacturers to disclose the presence of hazardous chemicals such as PFASs on product labels and online. AB 652 by Assemblymember Laura Friedman (D-Glendale) bans the use of toxic PFASs in products for children, such as car seats and cribs, beginning July 1, 2023. The state earlier this year required manufacturers of carpets and rugs to consider less toxic alternatives to PFASs, which pose a particular exposure risk to children when used in carpets and rugs.

A full list of the bills signed by the Governor is below:

AB 652 by Assemblymember Laura Friedman (D-Glendale) — Product safety: juvenile products: chemicals: perfluoroalkyl and polyfluoroalkyl substances.

AB 881 by Assemblymember Lorena Gonzalez (D-San Diego) — Recycling: plastic waste: export.

AB 962 by Senator Sydney Kamlager (D-Los Angeles) — California Beverage Container Recycling and Litter Reduction Act: reusable beverage containers.

AB 1200 by Assemblymember Philip Ting (D-San Francisco) — Plant-based food packaging: cookware: hazardous chemicals.

AB 1201 by Assemblymember Philip Ting (D-San Francisco) — Solid waste: products: labeling: compostability and biodegradability.

AB 1276 by Assemblymember Wendy Carrillo (D-Los Angeles) — Single-use foodware accessories and standard condiments.

AB 1311 by Assemblymember Jim Wood (D-Santa Rosa) — Recycling: beverage containers.

SB 343 by Senator Ben Allen (D-Santa Monica) — Environmental advertising: recycling symbol: recyclability: products and packaging.

SB 619 by Senator John Laird (D-Santa Cruz) — Organic waste: reduction regulations: local jurisdiction compliance.

For full text of the bills, visit: http://leginfo.legislature.ca.gov.

GOVERNMENT REGULATIONS – COLORADO

COLORADO – SINGLE-USE PLASTIC ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	URL
Denver, CO	2024		Single-use foam containers Ban			https://www.cpr.org/2021/07/06/colorado-plastic-bag-ban/
Denver, CO	July. 1, 2021		Plastic Bag Ban			https://www.cpr.org/2021/07/06/colorado-plastic-bag-ban/
Denver, CO	July 6, 2021		Colorado Single-Use Plastics Law			https://environmentcolorado.org/news/coe/colorado-governor-signs-groundbreaking-single-use-plastic-bill-law%20
Colorado #3 (statewide)	Jan 1, 2024	Retail & Grocery	Plastic Bag Ban	No plastic film allowed	Municipalities allowed to increase bag tax (described in law as a "fee"). State law exempts "small" Colorado-only retailers with no more than 3 locations. Retailers allowed 5 months to use up any plastic-bag inventory purchased before the effective date, but must charge 10 cents per bag during this period. Most restaurants exempt from ban under provision for food service facilities that prepare or serve food "in individual portions for immediate on-or off-premises consumption."	COLORADO HOUSE BILL 20-1162 [2021]
Breckenridge, CO #3	Jan 1, 2024	ALL (Foodservice, Retail & Grocery)	Plastic Bag Ban	No plastic allowed, including bio-based polymers	Retailers may use up existing inventories of paper bags with 40% post-consumer recycled content.	TITLE 5, CHAPTER 12 (BILL ___ [2023])
Steamboat Springs, CO #3	Jan 1, 2024	Retail & Grocery	Plastic Bag Ban	2.25 mils	Applies to all retailers	CHAPTER 19, ARTICLE IV (ORDINANCE #2699, AS AMENDED BY ORDINANCE #2789)
Frisco, CO #3	Sep 1, 2023	ALL (Foodservice, Retail & Grocery)	Plastic Bag Ban	No plastic film allowed	Minimum PCR for paper bags increased from 40% to 100%.	CHAP. 124, ART. II (ORD. 23-19)
Aspen, CO #2	May 1, 2023	Retail & Grocery	Plastic Bag Ban	2.25 mils	Affects "large grocerss" as well as retailers with more than three facilities in Colorado or at least one outside the state.	TITLE 13, CHAPTER 13.24 (ORD. 6 [2023])
Colorado #2 (statewide)	Jan 1, 2023	ALL (Foodservice, Retail & Grocery)	Tax/Fee	No plastic film allowed	Municipalities allowed to increase bag tax (described in law as a "fee"). State law exempts "small" Colorado-only retailers with no more than 3 locations.	COLORADO HOUSE BILL 20-1162 [2021]
Boulder, CO #2	Jan 1, 2023	Retail & Grocery	Tax/Fee	2.25 mils	One-year grace period allowed fo small stores (as defined under state law).	DISPOSABLE BAG FEE ORDINANCE
Steamboat Springs, CO #2	Jan 1, 2023	Retail & Grocery	Ban	2.25 mils	Applies only to stores with at least 10K sq. ft.	CHAPTER 19, ARTICLE IV (ORDINANCE #2699, AS AMENDED BY ORDINANCE #2789)

GOVERNMENT REGULATIONS – HAWAII

HONOLULU – SINGLE-USE PLASTIC ORDINANCES

Jurisdiction	Enforcement Date	Restriction	URL
Hawaii (Statewide)	2015	Plastic Bag Ban	
Honolulu, HI	Jan. 1, 2021	Food vendors will be banned from providing plasticware, including utensils, straws, foam plates, cups, and food containers.	https://www.nycfoodpolicy.org/food-policy-center-honolulu-plastics-ban/
Honolulu, HI	Jan. 1, 2022	Additional plastic food ware will be included and all other businesses will also have to adhere to the policy.	https://www.nycfoodpolicy.org/food-policy-center-honolulu-plastics-ban/
Honolulu, HI	Jan. 1, 2021 Jan. 1, 2022	Hawaii's disposable foodware ordinance code	https://www.honolulu.gov/opala/recycling/dfwo.html#:~:text=Effective%20January%201%2C%202022%3A&text=No%20businesses%20shall%20sell%20polystyrene,or%20disposable%20plastic%20food%20ware
Honolulu, HI	December 15, 2019	Honolulu Hawaii's single use plastic ban	https://www.surfrider.org/coastal-blog/entry/historic-single-use-plastic-ban-passes-in-honolulu

GOVERNMENT REGULATIONS – IDAHO

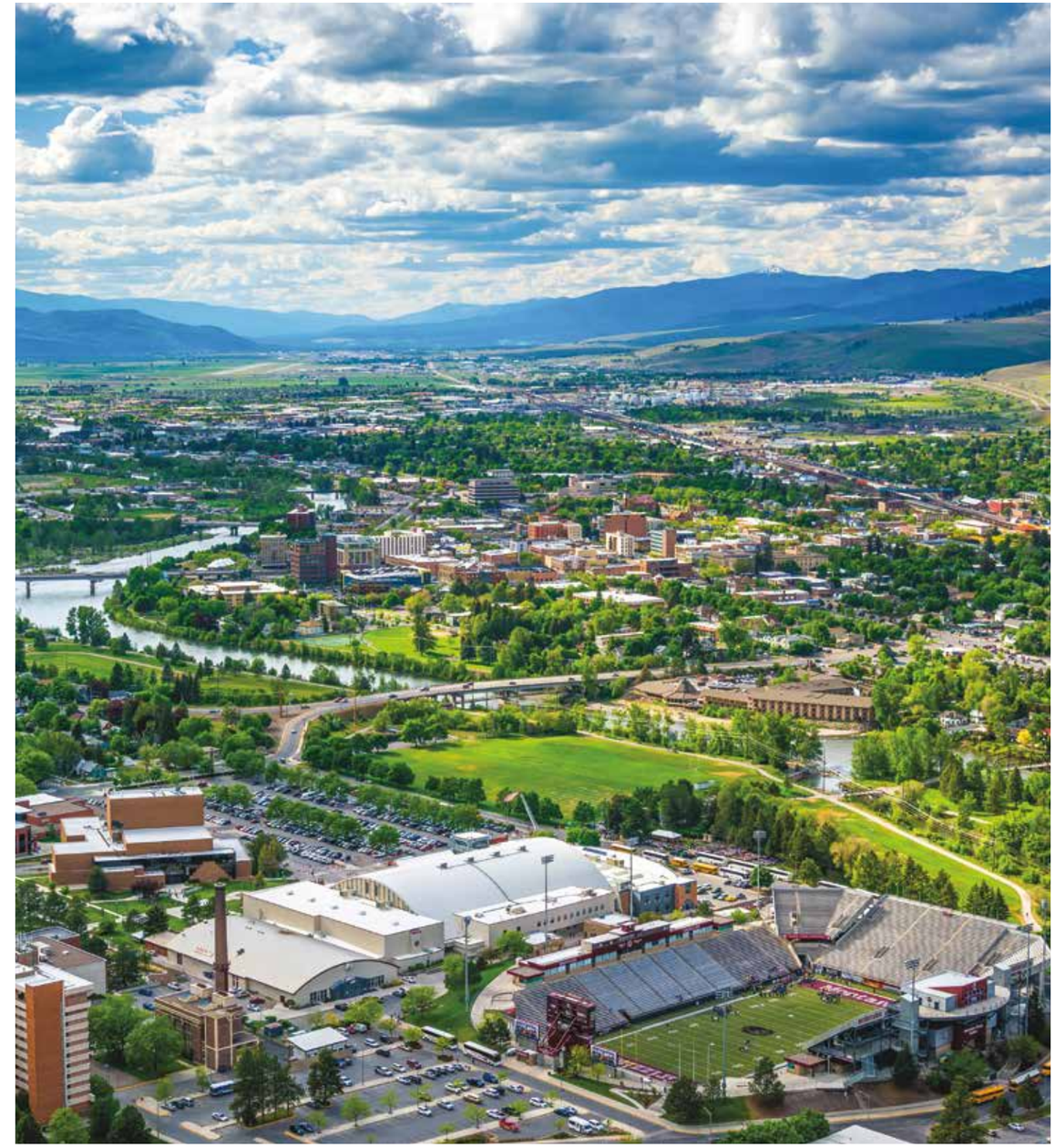
IDAHO – PLASTIC BAG ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Idaho (preemption)		ALL (Foodservice, Retail & Grocery)	Preemption			Idaho Code, Title 67, Chapter 23, Section 67-2340 (2016 HB 372)

IDAHO – SINGLE-USE PLASTIC ORDINANCES

Jurisdiction	Enforcement Date	Restriction	URL
Idaho	2020	Repeal the 2016 bill and reestablish local decision-making over plastic bags	https://www.idahoconservation.org/legislative-bill/hb-338-repealing-ban-on-plastic-bag-bans-2020/
Idaho	2016	Regulation of auxiliary containers	https://legislature.idaho.gov/statutesrules/idstat/title67/t67ch23/sect67-2340/

GOVERNMENT REGULATIONS – MONTANA



MONTANA – PLASTIC BAG ORDINANCES

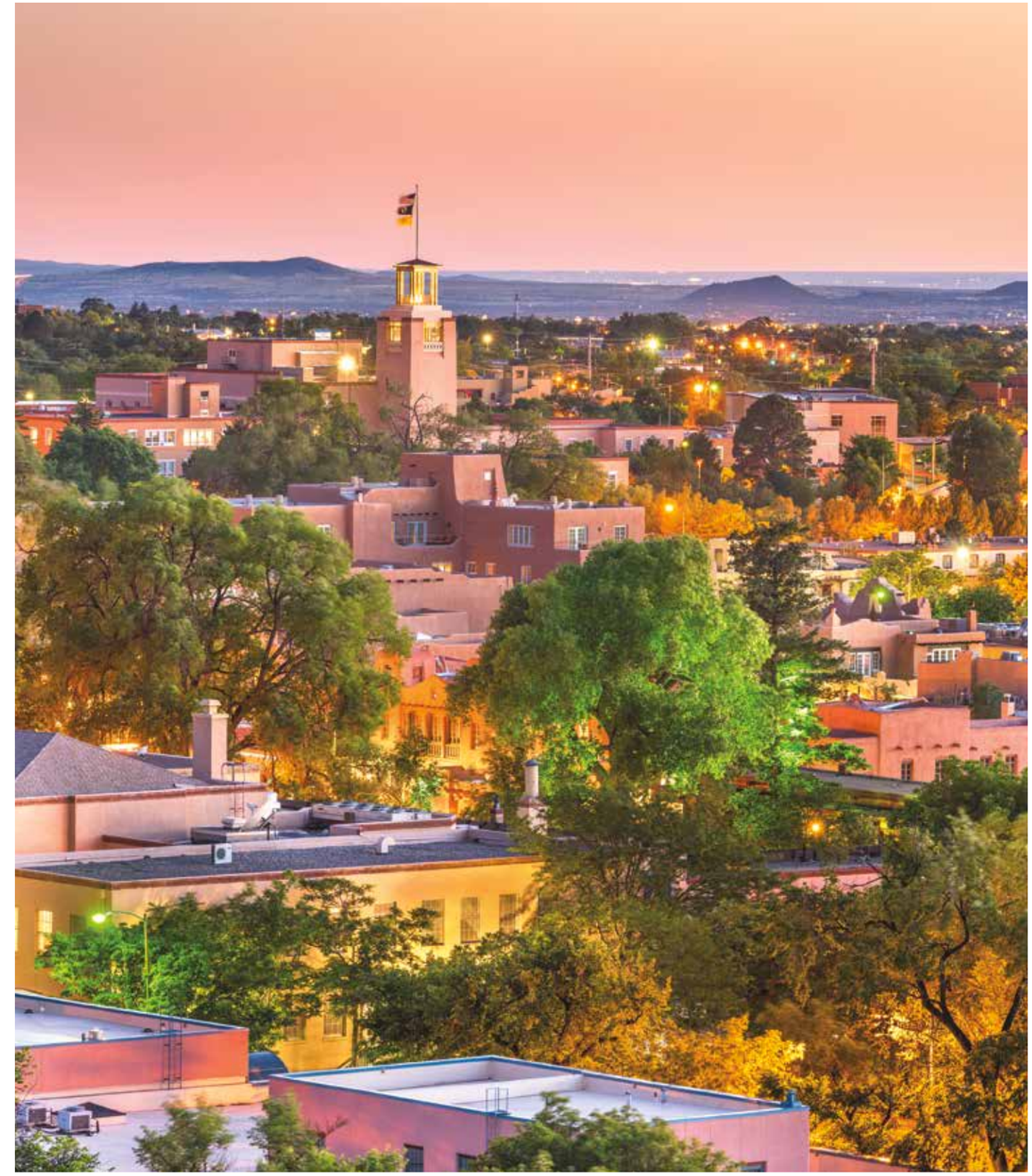
Jurisdiction	Enforcement Date	Restriction	URL
Montana	2021	Montana single use plastics debate	https://missoulacurrent.com/government/2021/02/gop-food-containers/
Montana	2019	Montana SB 0120 plastic straw law	https://leg.mt.gov/bills/2019/billhtml/SB0120.htm
Montana	2019	Montana SB 0121 plastic bag law	https://leg.mt.gov/bills/2019/billhtml/SB0121.htm

GOVERNMENT REGULATIONS – NEVADA

NEVADA – PLASTIC BAG ORDINANCES

Jurisdiction	Enforcement Date	Restriction	URL
Nevada	July 1, 2018.	Nevada legislature proposes ban on single use plastic bags	https://www.capradio.org/articles/2017/03/21/nevada-democrats-seek-2022-plastic-bag-ban/#:~:text=Legislation%20introduced%20Monday%20would%20require,plastic%20bags%20beginning%20in%202022.
Nevada	2020	Nevada grocers prohibit use of reusable plastic bags in-store due to risks of corona virus	https://sierranevadaally.org/2020/04/06/northern-nevada-grocers-ban-or-limit-the-use-of-reusable-bags-in-response-to-the-novel-coronavirus-environmental-impact-unknown/

GOVERNMENT REGULATIONS – NEW MEXICO



NEW MEXICO– PLASTIC BAG ORDINANCES

Jurisdiction	Enforcement Date	Restriction	URL
New Mexico	Jan. 1, 2020	New Mexico single-use plastics law	https://www.wastedive.com/news/sweeping-single-use-plastic-ban-proposed-in-albuquerque-new-mexico/545428/

GOVERNMENT REGULATIONS – OREGON

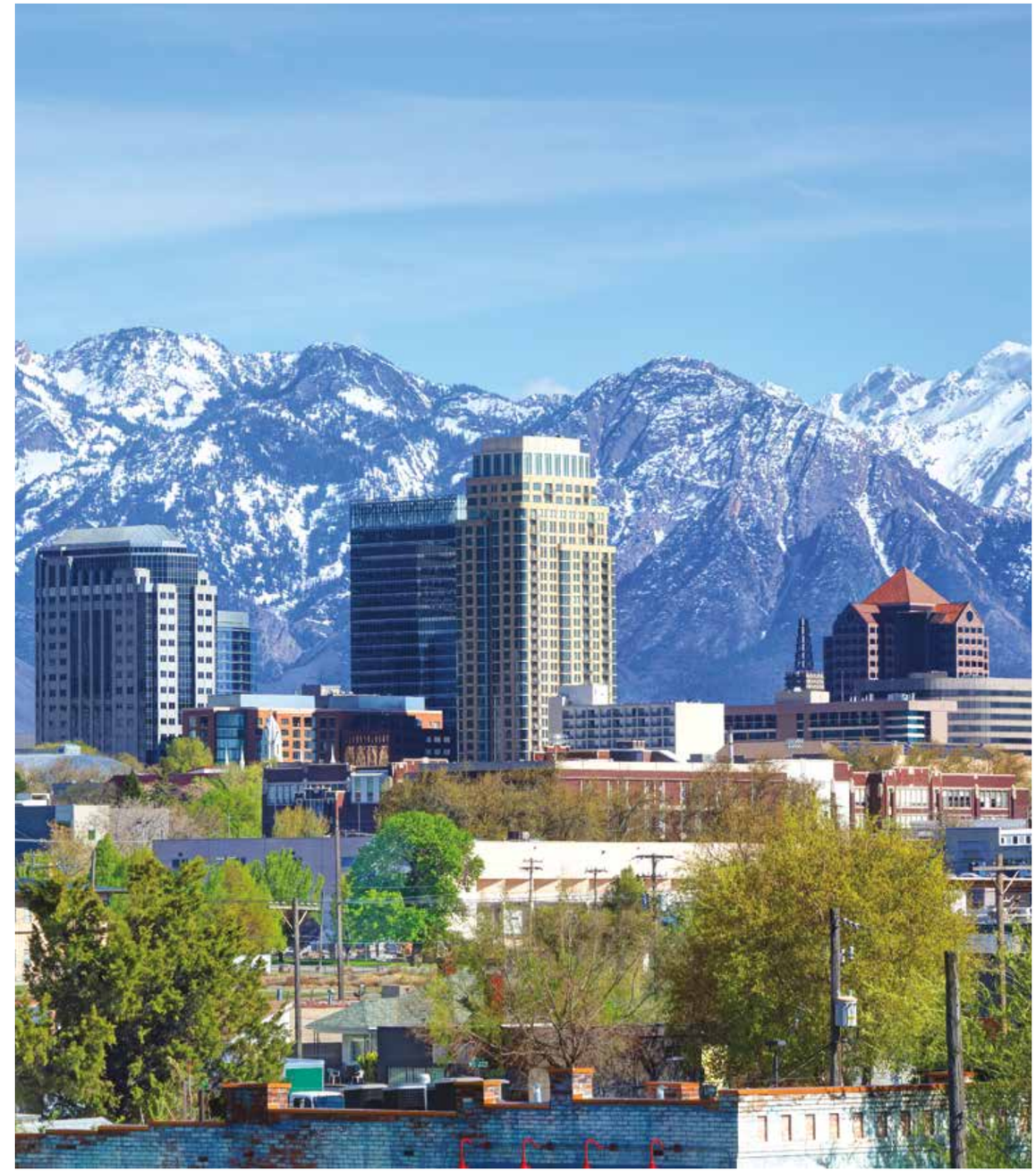
OREGON – PLASTIC BAG ORDINANCES

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Oregon (statewide)	Jan 1, 2020	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Ban is not officially suspended, but the governor has recommended lax enforcement at the local level due to paper-bag shortages attributed to the Covid-19 crisis. Minimum 5-cent bag fees remain in effect for all checkout bags.	Chapter 434, 2019 Laws
Ashland, OR	Nov 6, 2014	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Effectively preempted by state law, but local ordinances that are substantially similar remain in force. [See entry for Oregon (statewide).]	#3094
Bend, OR	Jul 1, 2019	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Mostly preempted by state law, except for a higher fee for paper and reusable bags. [See entry for Oregon (statewide).]	Chapter 5.60, Title 5
Eugene, OR	May 1, 2013	Retail & Grocery	Ban	4.0 mils	Effectively preempted by state law, but local ordinances that are substantially similar remain in force. [See entry for Oregon (statewide).]	20498
Forest Grove, OR	Jul 15, 2016	Retail & Grocery	Ban	4.0 mils	Effectively preempted by state law, but local ordinances that are substantially similar remain in force. [See entry for Oregon (statewide).]	40955
Hillsboro, OR	Jul 1, 2019	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Effectively preempted by state law, but local ordinances that are substantially similar remain in force. [See entry for Oregon (statewide).]	single-use bag law
Hood River, OR	Mar 1, 2017	Retail & Grocery	Ban	2.25 mils	Effectively preempted by state law, but local ordinances that are substantially similar remain in force. [See entry for Oregon (statewide).]	8
Lake Oswego, OR	Jul 1, 2019	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Effectively preempted by state law, but local ordinances that are substantially similar remain in force. [See entry for Oregon (statewide).]	2806
Manzanita, OR	Nov 4, 2017	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Effectively preempted by state law, but local ordinances that are substantially similar remain in force. [See entry for Oregon (statewide).]	Bill 17-04
McMinnville, OR	Mar 16, 2017	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Effectively preempted by state law, but local ordinances that are substantially similar remain in force. [See entry for Oregon (statewide).]	#5018
Milwaukie, OR	Mar 1, 2019	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Partially preempted by state law. Enforcement of both the local ordinance and state law was suspended due to Covid-19, but has reportedly since resumed.	Ordinance 2162
Newport, OR	Jul 1, 2019	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	As amended effective Jan. 1, 2020 to align it with new state law. Enforcement was suspended due to Covid-19, but resumed for large retailers on 3/31/21 and for all others on 5/1/21.	Municipal Code, Chapter 4.30
Portland, OR	Oct 1, 2011	ALL (Foodservice, Retail & Grocery)	Ban	4.0 mils	Effectively preempted by state law (but whose enforcement was suspended due to Covid-19).	185737 and 184759
Silverton, OR	Jul 1, 2019	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Effectively preempted by state law, but local ordinances that are substantially similar remain in force. [See entry for Oregon (statewide).]	NO 18-26

OREGON – SINGLE-USE PLASTIC ORDINANCES

Jurisdiction	Enforcement Date	Restriction	URL
Portland, OR	2020	Single use plastic ban ordinances	https://www.portland.gov/code/17/103
Oregon	Jan. 1, 2020	Single-Use Plastic Bags and Straws	https://www.orcities.org/application/files/4816/0105/3840/Single-UseBagsStrawsFAQ9-25-20.pdf

GOVERNMENT REGULATIONS – UTAH



UTAH – PLASTIC BAG ORDINANCES

https://www.sltrib.com/news/politics/2019/12/05/logan-becomes-third-utah/

Jurisdiction	Enforcement Date	Restriction	URL
Logan, UT	July 1, 2018.	ban on single-use plastic bags	https://www.sltrib.com/news/politics/2019/12/05/logan-becomes-third-utah/

GOVERNMENT REGULATIONS – WASHINGTON

WASHINGTON – PLASTIC STRAWS AND UTENSILS ORDINANCES

Jurisdiction	Enforcement Date	Restriction	URL
Seattle, WA	July 1, 2018.	Utensils banned include disposable plastic forks, plastic spoons, plastic knives, and plastic cocktail picks.	https://www.seattle.gov/Documents/Departments/SPU/Services/Recycling/EnglishSPUFlyer-LetterStrawsandUtensilsAM.pdf
Washington (statewide)	January 1, 2023	HB1799 – Develop a plan for use of compost in city projects and provide citizen education on compost use.	https://compostmanufacturingalliance.com/2022/04/03/hb1799/

https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste/Waste-reduction-programs/Plastics/Plastic-bag-ban

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Washington (statewide)	Jan 1, 2021	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	DELAYED by executive order -- initially until Jan. 30, 2021, but the legislature suspended it indefinitely until the COVID-19 pandemic ends. Now that that order has been lifted, enforcement begins on Oct. 1, 2021. Required fee for reusable bags only increases to 12 cents in January 2026, but only for those made of plastic film.	Chapter 138, 2020 Laws,
Anacortes, WA	May 4, 2020	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Delayed indefinitely due to the Covid-19 crisis.	Section 5.47.050
Bainbridge Island, WA	Nov 1, 2012	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Enforcement suspended due to Covid-19 crisis	Section 13.28.200 (Ordinance #2012-06)
Bellingham, WA	Aug 1, 2012	Retail & Grocery	Ban	2.25 mils	Suspended for at least 1 year due to the Covid-19 crisis.	Municipal Code, Chapter 6.47.010
Bothell, WA	Apr 22, 2020	ALL (Foodservice, Retail & Grocery)	Ban	No plastic film allowed		Chapter 8.75 (Ordinance #2296)
Bremerton, WA	Jan 1, 2020	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Enforcement suspended due to Covid-19 crisis	Title 6, Chapter 6.20 BMC (Ordinance #5368)
Burien, WA	Jan 1, 2020	ALL (Foodservice, Retail & Grocery)	Ban	No noncompostable plastic allowed	Suspended until 10/1/21 due to the Covid-19 crisis	Chapter 8.56 (Ordinance #690)
Edmonds, WA	Aug 27, 2010	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Enforcement delayed, originally until June 27, 2020, due to the Covid-19 crisis	Chapter 6.80 (Ordinance #3749)
Ellensburg, WA	Jan 1, 2018	ALL (Foodservice, Retail & Grocery)	Tax/Fee	2.25 mils		Chapter 5.64 (Ordinance #4750)
Everett, WA	Sep 30, 2019	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Was suspended (initially to Apr. 22, 2020) due to Covid-19 crisis	Ordinance #3643-18

WASHINGTON - PLASTIC BAG ORDINANCES

https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste/Waste-reduction-programs/Plastics/Plastic-bag-ban

Bag Law by Jurisdiction	Enforcement Date	Channels	Single-use Restriction	Min. Gauge (plastic)	Notes	Linked
Friday Harbor, WA	May 1, 2017	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils		Bill 1618, Code 8.14
Gig Harbor, WA	Apr 18, 2019	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Enforcement suspended due to Covid-19 crisis. Allows retailers to charge fees for bags, but for no more than the actual cost.	1398 (Article 27)
Issaquah, WA	Mar 1, 2013	Retail & Grocery	Ban	2.25 mils	Original implementation was delayed 15 months for stores of less than 7,500 sq. ft. Suspended due to the Covid-19 crisis	Chapter 8.05 (Ordinance #2652)
Kenmore, WA	Jan 1, 2019	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Was suspended (initially through Apr. 30, but then extended) due to the Covid-19 crisis	Chapter 8.50 (Ordinance #18-0465)
Kent, WA	Mar 1, 2020	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Suspended) due to Covid-19 crisis	Chapter 8.02 (Ordinance #4331)
Kirkland, WA	Mar 1, 2016	ALL (Foodservice, Retail & Grocery)	Ban	Gauge not specified		Chapters 16.04 and 16.05 (Ordinance #4477)
Kitsap County, WA	Jan 1, 2020	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Suspended indefinitely due to Covid-19 crisis. Applies only to unincorporated areas within the county.	Chapter 9.50 (Ordinance #577-2019)
La Conner, WA	Aug 1, 2018	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils		Chapter 7.50 (Ordinance #1169)
Lacey, WA	Jul 1, 2014	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Suspended) due to Covid-19 crisis	Title 8, Chapter 8.06 (Ordinance #1429)
Lake Forest Park, WA	Sep 23, 2018	Retail & Grocery	Ban	2.25 mils	Suspended) due to Covid-19 crisis. Wording of ordinance seems to exclude restaurants, but could be interpreted differently.	Chapter 5.34 (Ordinance #1181)
Mercer Island, WA	Apr 22, 2014	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils		Chapter 8.45 (Ordinance #13c-13)
Mukilteo, WA	Jan 1, 2013	Retail & Grocery	Ban	2.25 mils	Suspended) due to Covid-19 crisis. Wording of ordinance seems to exclude restaurants, but could be interpreted differently.	Chapter 8.22 (Ordinances #1294 and #1299)
North Bend, WA	Jan 1, 2019	ALL (Foodservice, Retail & Grocery)	Ban	2.5 mils		Chapter 8.42 (Ordinance #1678)
Olympia, WA	Jul 1, 2014	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	All bag fees have been waived indefinitely due to the Covid-19 crisis.	Chapter 8.26 (Ordinance #6869)
Port Angeles, WA	Jul 3, 2018	Retail & Grocery	Tax/Fee	2.25 mils	Suspended) due to Covid-19 crisis. Retail ("retailers") is not defined in statute, could be interpreted to include restaurants.	Title 5, Chapter 5.95 Ordinance #3604)
Port Orchard, WA	Jan 1, 2020	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Suspended) due to Covid-19 crisis	Title 6, Chapter 6.20 (Ordinance #033-19)
Port Townsend, WA	Nov 1, 2012	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils		Title 6, Chapter 6.26 (Ordinance #3076)
Poulsbo, WA	Jun 1, 2020	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils		Chapter 8.10 (Ordinance 2020-04)
Quil Ceda Village, WA	Jan 1, 2018	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Minimum gauge is 4.0 mils for 100% recyclable bags with a capacity of less than 882 cubic inches.	Chapter 8.03 (Ordinance #2017-032)
San Juan County, WA	May 1, 2017	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Applies only to unincorporated areas within the county.	Chapter 5.12 (Ordinance #10-2016, as amended by #2-2017)
Seattle, WA	Jul 1, 2012	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Enforcement suspended due to the Covid-19 crisis, except for paper-bag fee.	Title 21, Subtitle III, Chapter 21.36, Section 21.36.100 (Ordinance #123775, as amended by Ordinance #125165 [2016])
Shoreline, WA	Feb 1, 2014	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Was suspended due to the Covid-19 crisis, initially until June 11, 2020.	Chapter 9.25 (Ordinance #653)
Snohomish, WA	Jan 1, 2020	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Suspended due to the Covid-19 crisis	Chapter 8.21 (Ordinance #2360)
Tacoma, WA	Jul 12, 2017	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Suspended due to the Covid-19 crisis	Section 12.09.215 (Ordinance #28367)
Thurston County, WA	Jul 1, 2014	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Applies only to unincorporated areas within the county.	Chapter 8.26 (Ordinance #14934)
Tumwater, WA	Jul 1, 2014	ALL (Foodservice, Retail & Grocery)	Ban	2.25 mils	Suspended (initially through Apr. 30) due to the Covid-19 crisis	Chapter 8.14 (Ordinance #2013-016)

CLEAN PACKAGING

WHAT IS CLEAN PACKAGING?

You might be hearing the term "clean packaging" lately and wondering what it means? Over the past decade scientists have learned that select chemicals and additives have been leaching out of a variety of different grades of plastic into our food, our beverages and even dissolving into our rivers, waterways and oceans. Chemicals like PFAS or polyfluorinated chemicals are being discovered in microscopic portions in a variety of foods, beverages and among our environment.

It is common for these chemicals to be referred to by the acronym PFAS, which stands for "polyfluorinated alkyl substance" but BPI or Biodegradable Products Institute (An environmental materials testing agency) refers to them as fluorinated chemicals. These chemicals are being used by a variety of packaging manufacturers and converters because they add grease and sugar oil resistant properties to their products when used with food. However, the PFAS chemicals are being eradicated from many paper wrappers and pulp fiber packaging products because they are harmful to the nature of the organic compost material in commercial compost facilities. Farmers don't want to buy fertilizer or compost from commercial compost yards that are blending in foreign substrates into their compost that have fluorinated chemicals embedded within their fibers. These chemicals prevent them from using clean material on their crops to then sell as organic.

The City of San Francisco recently passed an ordinance stating, among other things, that, "*After January 1, 2020 all compostable foodware that is distributed, sold, or provided in San Francisco must have no intentionally added fluorinated chemicals. To verify, foodware must be BPI certified*."

On a federal level members of Congress are pushing hard on the Environmental Protection Agency to get tougher on regulating water contamination from **fluorinated chemicals**, including those used in making fluoropolymer plastic.

At a September 6th, 2018 hearing in Washington, one of the first held by Congress on the issue, a bipartisan collection of lawmakers pressed the EPA on its plans, and a panel of state regulators urged Washington to set national standards and beef up funding for cleanups.

The PFAS group includes chemicals such as perfluorooctanic acid (PFOA), perfluorooctanesulfonate (PFOS) and GenX. These chemicals have been produced since the 1950's and used in food packaging, stains, water repellant fabrics, Teflon non-stick products and even firefighting foams which have all been linked to a variety of health hazards over the years. These chemicals have been known to leach into the ground water or even carried in the air. Several states are beginning to address the hazards of PFAS chemicals like North Carolina, New York and Washington. In fact the state of

California passed assembly bill AB 958 that requires a manufacturer of food packaging to visibly disclose on the outside of their case the presence of perfluoroalkyl substances.

Clean packaging also means that the plastic itself is safe to recycle, grind up and use again in other products. Some plastics are not clean or safe to recycle as they are compounds of virgin plastic blended with other additives to bind their molecular structure and or fillers are added to reduce cost. One of the key reasons many grades of plastic are not in demand, after they have been recycled, is because those who might want to buy the plastic and grind it up to use in other products do not necessarily always know what else, besides plastic, they are getting in these blended grades of plastic. For example, some manufacturers in the food industry use talc as a filler to bring the cost of their resin down. This is a good thing in that it also brings the cost of the packaging down for the restaurant and the consumer. **However, it's ultimately a bad thing in that there is no demand in the afterlife for these types of plastics.**

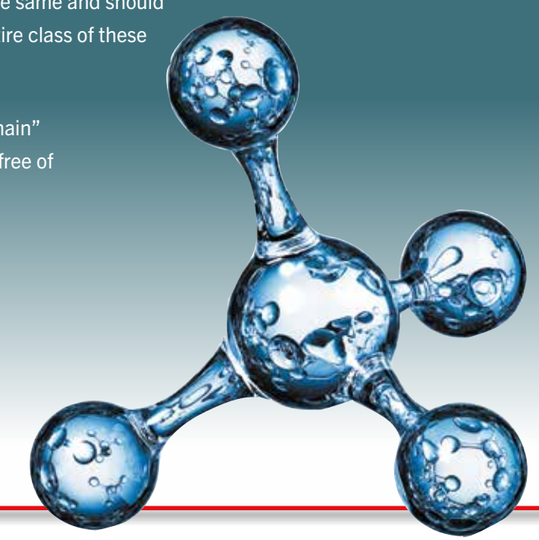
In the end clean packaging is considered substrates and grades of plastics that don't harm us in their use with food and that are ultimately safe to recycle and to be used again in pure form in afterlife applications.

(PFAS) FLUORINATED CHEMICALS & FOODSERVICE PACKAGING

Foodservice packaging is made from a wide variety of materials. These products go through rigorous testing to ensure that they meet stringent regulations, ensuring the safe delivery of foodservice items to consumers.

However, there has been some confusion over the safety of some chemicals used in the manufacture of paper foodservice packaging, particularly claims that certain coatings are "toxic" and dangerous to human health and the environment. The truth is…

- Polyfluoroalkyl substances (PFAS) are a class of over 3,000 synthetic, man-made chemicals. They are also referred to as "polyfluorinated chemicals" (PFCs). There are variations within this large class of chemicals, including their properties, toxicity and intended use.
- Certain PFAS may be used in some paper foodservice packaging items likes wraps, food containers and plates to prevent oil, grease and water from leaking through the package onto skin, clothing, furniture, etc.
- There are two sub-categories of PFAS that have been used in food packaging:
  - "Long chain" or "C8" chemicals, since they have 8 or more carbons in their structure. Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) are two examples. It is important to note that these were voluntarily phased out and are no longer allowed in the U.S.
  - "Short chain" or "C6" chemicals, since they have 6 or less carbons in their structure. Manufacturers of these newer chemicals submit their specific formulations to the U.S. Food & Drug Administration for rigorous review and, if found to be safe for their intended use, may be used. Today, there are less than three dozen short-chain PFAS chemicals allowed by the FDA in the U.S.
- The presence of fluorine may be used as an indicator when testing for PFAS. However, this may not provide accurate results, and it does not indicate whether the PFAS are "long chain" (no longer in use in the U.S.) or "short chain" (currently in use in the U.S.). All PFAS chemicals are not the same and should not be treated the same. Therefore, calls to remove the entire class of these beneficial chemicals are unfounded.
- Today's foodservice packaging use FDA-reviewed "short chain" fluorochemicals or even newer barrier coatings, which are free of fluorochemicals.



SOURCE: Foodservice Packaging Institute

A BRIEF HISTORY OF PFAS BANS IN FOOD PACKAGING

FROM 2016 TO 2022, THESE ACTIONS REDUCED THE USE OF PERAND POLYFLUOROALKYL SUBSTANCES (PFAS) IN PACKAGING.

PFAS, or poly or perfluoroalkyl, has been known as a variety of "chemicals of concern." PFAS chemicals have and still are in some applications even today and are typically used as a grease, oil and sugar barrier compound in paper, molded fiber and paperboard foodservice packaging substrates. It is important to know that there is no PFAS is plastic food packaging only paper or fiber substrates. Over the course of time studies show that PFAS short chain chemicals can and or could be a carcinogen to people if too much of it is ingested. As a result some states like California and New York have banned the use of PFAS in all products. Since PFAS became a concern take a look at the activity in reducing PFAS in food packaging over the last seven years.

2016

The FDA issued a series of amendments to food additive regulations and banned the use of the remaining long-chain PFAS in direct food applications. The FDA's actions meant that any use of these substances is no longer allowed in food packaging. Subsequently, most chemical manufacturers and therefore packaging manufacturers switched from one PFAS class to another. A responsible effort, and one necessary to maintain FDA compliance.

2017

With long-chain PFAS out of harm's way, the focus shifted to short-chain PFAS. In 2017, Biodegradable Product Institute (BPI) , a key certification organization within the compostable packaging industry, announced a change to its policy on PFAS and banned any product that uses intentionally added PFAS from its certification program. BPI is the recognized certification entity for compostable products in the North American market, and is often a package's golden ticket into a compost pile. Without BPI certification, a composability claim is often considered unsubstantiated. This announcement was a signal to brand owners and packaging manufacturers more changes were ahead.

2018

San Francisco's mayor signed the ordinance Single-Use Food Ware Plastics, Toxics, and Litter Reduction , that updated the city's Environmental Code on PFAS in food packaging, a major legislative move and the first blueprint for other municipalities to follow.

In the same year, two reports were released studying the impact of PFAS in food packaging. The Center for Environmental Health (CEH) released a report, "Avoiding Hidden Hazards: A Purchaser's Guide to Safer Food ware " and Toxic Free Future released the study Take Out Toxics: PFAS Chemicals in Food Packaging that assessed food packaging and the fluorine presence from five of the nation's largest grocery store chains. Similar to the EWG report, the Take Out Toxics study called out popular brands for using PFAS in their food packaging.

2019

In March, the governor of Maine signed an executive order and established a task force to study the effects of PFAS prevalence in Maine. This was the first time the issue was addressed at the state level and provided another early legislative blueprint to ban PFAS in food packaging use, sale, and distribution.

In the same year, Chemours , one of the four major PFAS chemical manufacturers, informed the FDA that it had stopped sales of its short-chain PFAS products in the US. With this commitment public, other chemical manufacturers began to move ahead with their plans to phase out PFAS use.

2020

At the turn of the new year, BPI's new policy for no intentionally added PFAS took effect, and the first BPI certified "PFAS-free" foodservice packaging products hit the market. This allowed the market to assess first generation Free-Of intentionally added PFAS products and what tradeoffs they were willing to accept for a "cleaner" package used in direct food applications. Later in the year, Toxic Free Future released a second report, Packaged in Pollution: Are food chains using PFAS in packaging? The report revealed new testing that indicated major fast-food chains were still using PFAS in some of their most popular takeout food packaging.

2021

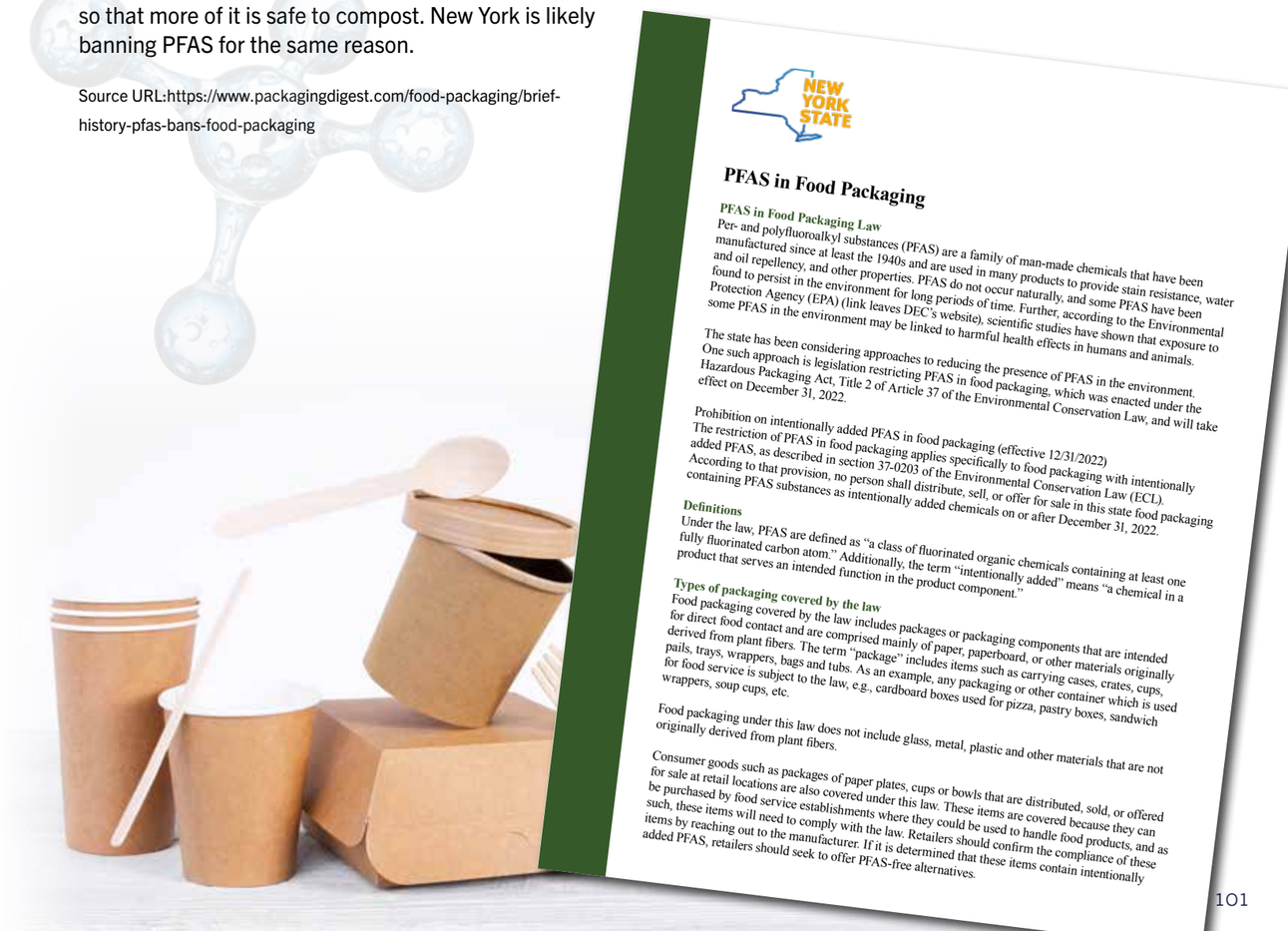
At the beginning of year, the remaining three major PFAS chemical manufacturers. in collaboration with the FDA, voluntarily announced a 3-year phaseout of the sale of short-chain PFAS used as grease resistance additives for paper and paperboard food packaging. This also included an 18-month phase out period of existing inventories. This announcement officially put a timer on innovation to develop Free-Of alternatives with the same product functionality before inventories ran out.

2022

With voluntary action in place, key legislation followed in California and New York . Both states adopted new laws and banned the use of PFAS in food packaging starting in January 2023. In the coming years, several additional states have approved similar legislation to ban PFAS use in food packaging.

I guess you might ask this question – "Why is PFAS still being used throughout most of the country?" The argument remains that there is not enough PFAS in paper or fiber food packaging substrates to really harm anyone and it's use is very critical to preventing greases, oils and sugars from staining through paper food packaging. Most of the country has yet to ban PFAS in food packaging. Today only California and New York have completely banned the use of it in all products. California is working towards zero waste by the year 2040 and so they are working hard to eradicate all dangerous chemical compounds from food packaging so that more of it is safe to compost. New York is likely banning PFAS for the same reason.

Source URL:https://www.packagingdigest.com/food-packaging/brief-history-pfas-bans-food-packaging



NEW YORK STATE

PFAS in Food Packaging

PFAS in Food Packaging Law

Per- and polyfluoroalkyl substances (PFAS) are a family of man-made chemicals that have been manufactured since at least the 1940s and are used in many products to provide stain resistance, water and oil repellency, and other properties. PFAS do not occur naturally, and some PFAS have been found to persist in the environment for long periods of time. Further, according to the Environmental Protection Agency (EPA) (link leaves DEC's website), scientific studies have shown that exposure to some PFAS in the environment may be linked to harmful health effects in humans and animals.

The state has been considering approaches to reducing the presence of PFAS in the environment. One such approach is legislation restricting PFAS in food packaging, which was enacted under the Hazardous Packaging Act, Title 2 of Article 37 of the Environmental Conservation Law, and will take effect on December 31, 2022.

Prohibition on intentionally added PFAS in food packaging (effective 12/31/2022)
The restriction of PFAS in food packaging applies specifically to food packaging with intentionally added PFAS, as described in section 37-0203 of the Environmental Conservation Law (ECL). According to that provision, no person shall distribute, sell, or offer for sale in this state food packaging containing PFAS substances as intentionally added chemicals on or after December 31, 2022.

Definitions

Under the law, PFAS are defined as "a class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom." Additionally, the term "intentionally added" means "a chemical in a product that serves an intended function in the product component."

Types of packaging covered by the law

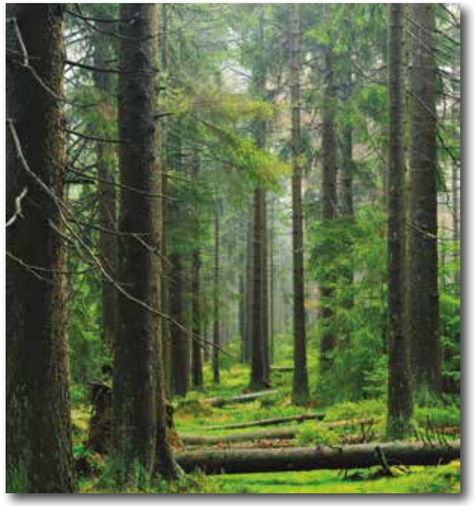
Food packaging covered by the law includes packages or packaging components that are intended for direct food contact and are comprised mainly of paper, paperboard, or other materials originally derived from plant fibers. The term "package" includes items such as carrying cases, crates, cups, pails, trays, wrappers, bags and tubs. As an example, any packaging or other container which is used for food service is subject to the law, e.g., cardboard boxes used for pizza, pastry boxes, sandwich wrappers, soup cups, etc.

Food packaging under this law does not include glass, metal, plastic and other materials that are not originally derived from plant fibers.

Consumer goods such as packages of paper plates, cups or bowls that are distributed, sold, or offered for sale at retail locations are also covered under this law. These items are covered because they can be purchased by food service establishments where they could be used to handle food products, and as such, these items will need to comply with the law. Retailers should confirm the compliance of these items by reaching out to the manufacturer. If it is determined that these items contain intentionally added PFAS, retailers should seek to offer PFAS-free alternatives.

PAPER

Paper is about as “green” as it gets when it comes to foodservice packaging materials. However, are we really doing the right thing by cutting down so many trees to make thousands of different products each year. Ironically, the U.S. forest tree inventory has increased by 39% since 1952, yielding more living trees today than ever before. In fact, there are 10 million more acres of forest in the United States today than there were 15 years ago. Tree fiber pulp, or paper, is the resource for literally millions of products not only within the foodservice industry but in consumer retails products as well. Can you imagine what life would be like without paper towels, tissue, copier paper, paper plates and most importantly toilet paper? There are a lot of trees grown and cut down to fill our demand; however, did you know nearly 80% of America’s paper mills use post-consumer recycled paper? Approximately 140 domestic mills use recycled paper exclusively to manufacturer their products.



Many consumers have become so concerned about the environment that the demand for unbleached paper has grown in popularity. For example, today natural kraft sandwich wrap and natural kraft pizza boxes are beginning to out sell the traditional white color. Natural kraft paper offers a significant benefit toward a more sustainable environment. Advantages of producing natural, unbleached paper versus bleached paper: 21% less wood pulp used, 10% fewer greenhouse gases produced, 46% less waste water released and 16% less solid waste produced. As a result, we save 6089 trees, remove 15 full swimming pools of waste water, and 13 garbage trucks of solid waste for every 1000 tons of natural kraft paper produced vs. bleached paper of the same basic weight.

Paper products like cake boxes, office paper, pizza boxes and newspaper are generally referred to as “fiber.” Fiber recycling is a specialized process that produces clean pulp, which can be used to make recycled content paper and paperboard. Materials from office, school and business recycling programs are captured by collection companies and brought to recycling centers, which separate the co-mingled cardboard, newspaper and mixed paper into large bundles called “bales” for sale to mills for recycling. Once at the mill, the material is mixed with water and chemicals and reduced to pulp slurry in a giant blender called a pulper. Following pulping, the pulp mix is diluted with water and passed through a system of centrifugal cleaning equipment and screens. The pulp is pressed to remove water and to dissolve inks, and is then fed into a kneeding machine. The fibers are then sent through a fine screening process that removes any remaining glue particles and small contaminants. Next, the pulp goes through a bleaching process. Here the pulp is mixed with chemicals, called surfactants, that make suds like washing machine soap. The finished recycled pulp is either sent to a mill to make paper or it is formed into sheets of pulp, called “wet lap,” for shipment and sale.

PAPER

	GRADES OF PAPER	RECYCLABLE	COMPOSTABLE (MEETS ASTM-D6400)
	VIRGIN BLEACHED KRAFT	YES	YES
	VIRGIN UNBLEACHED KRAFT (NATURAL)	YES	YES
	RECYCLED BLEACHED KRAFT	YES	YES
	RECYCLED UNBLEACHED KRAFT (NATURAL)	YES	YES
	GREASE RESISTANT PAPER	YES	YES
	DRY WAXED PAPER	NO	YES (IF SOY WAXED)
	POLY LAMINATED PAPER	NO*	NO
	MOISTURE RESISTANT PAPER	YES	YES
	POLY LAMINATED PAPERBOARD	NO*	NO
	CLAY COATED KRAFT	YES	YES
	PLA LINED PAPERBOARD	NO	YES

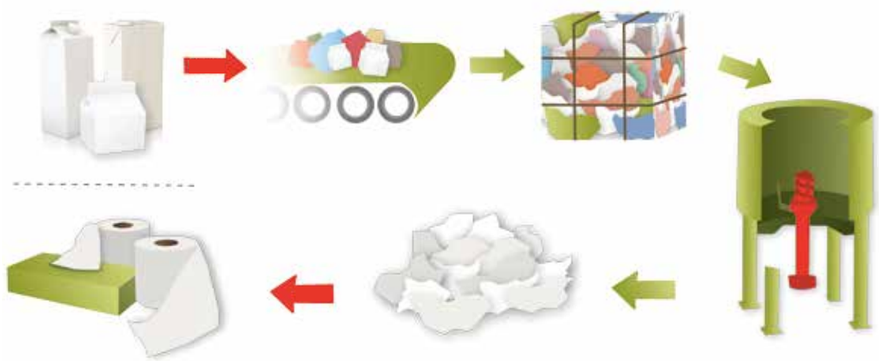
THE MOST COMMON FOODSERVICE PAPER PRODUCTS

- Sandwich Wrap
- Pastry Bags
- Carry Out Bags
- Plates
- Pizza Boxes
- Butcher Paper
- Coffee Cups
- Bread Bags
- Soda Cups
- Deli Interfold
- Table Covers
- Register Rolls
- Freezer Paper
- Drink Carriers
- Food Containers
- Pan Liners
- Napkins
- Boxes
- Patty Paper
- Labels

PAPER

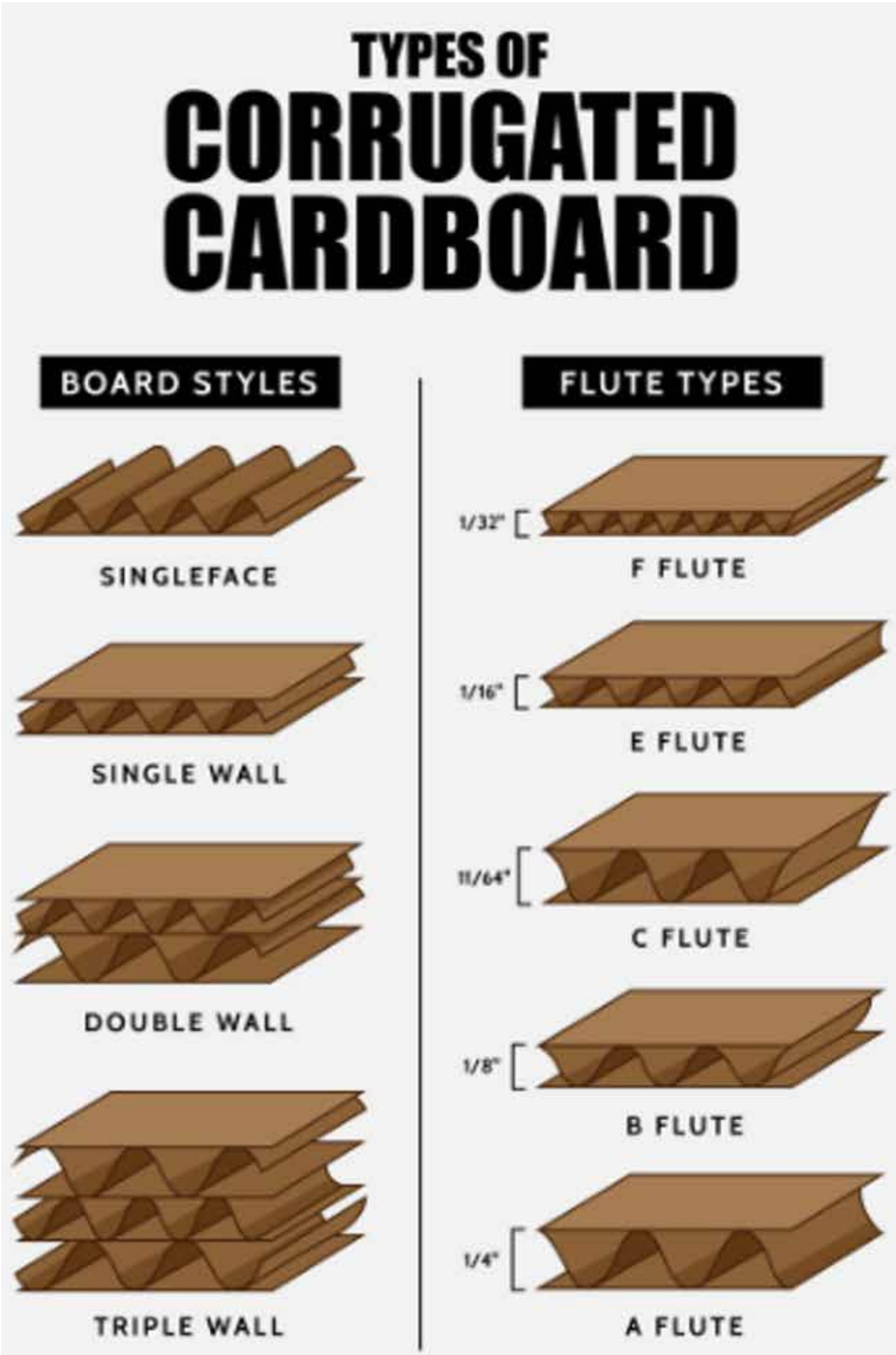
PAPERBOARD CARTON RECYCLING PROCESS

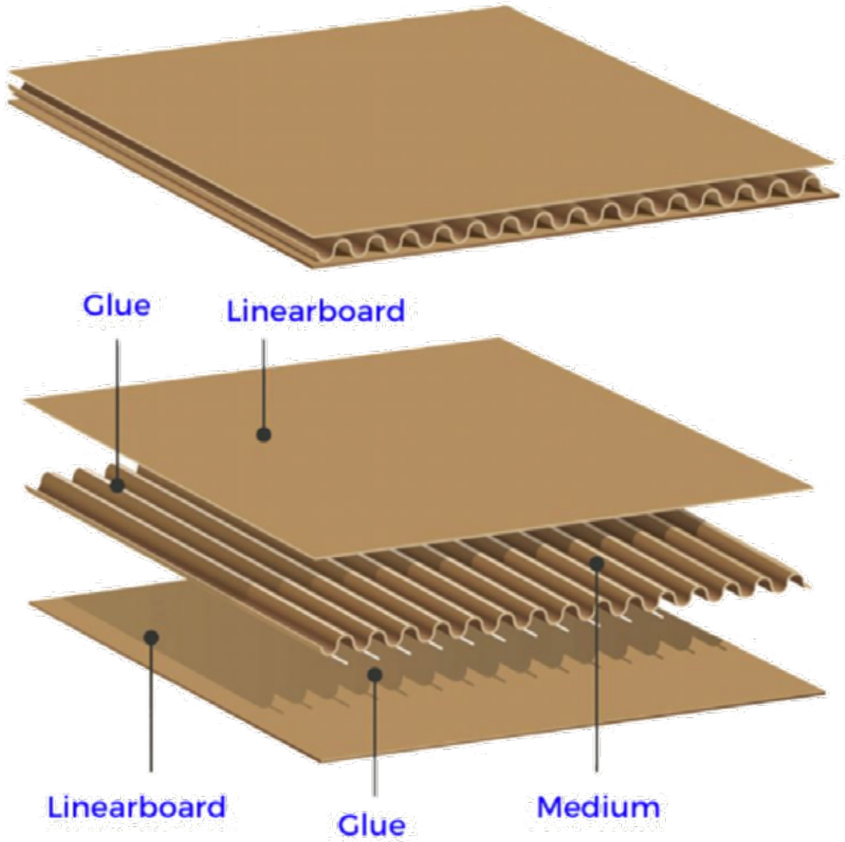
One packaging substrate that ironically does get recycled is paper hot and cold cups. Paper cups have a poly film laminated on the inside and paper cold cups have a poly film also laminated on the outside. A typical recycling center cannot remove the poly film from a cup to recycle the paper and so paper cups are sent to a different type of recycling center called a Hydra pulper plant.



First, cartons are separated from other materials to be recycled. This process occurs at a material recycling facility (MRF), where cartons are separated and shipped to a paper mill. **At the paper mill, fiber in the cartons is converted into pulp by mixing the cartons with water in a hydrapulper (like a giant kitchen blender). This pulp is then used to make paper towels, tissue paper, napkins and other useful paper products.**

The leftover aluminium and plastic that separate from paper products are also used to make building materials and roofing tiles. Many manufacturers actively work with paper mills to find better solutions for leftover materials considering environmental and financial aspects. It was stated earlier in this publication that to make paper packaging products you have to cut down trees. Although this may be true, what is great about paper is that it can be recycled (up to 6–7 times before the fibers become too short and weak) to make yet more products that consumers use every day.



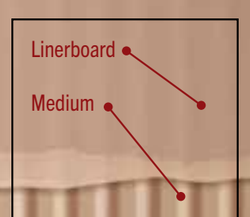


Paper packaging is divided into two groups based on two types of board used in making it:

1. **Paperboard**, also known as boxboard, carton board, and cardboard.
   Paperboard is basically a single sheet of very thick paper. It comes in many forms having various attributes. Common examples include chipboard and solid bleached sulfate, or SBS, board. The original pizza packaging was made of paperboard, and some pizza boxes still are today. The main advantage of paperboard is that it's inexpensive

2. **Corrugated board**, also known as corrugated fiberboard, corrugated paperboard, and combined board.
   Like paperboard, corrugated board also comes in many forms. The most common is single wall board, also known as double face board. It's what's used for most pizza boxes.

It consists of two outer sheets of flat paper, called facings or liners, glued to a fluted, or corrugated, inner sheet, called medium. The paper used for the facing or liner is called linerboard. The paper used for the medium is called medium. Corrugated pizza boxes are manufactured in several flutes. An arch with the proper curve is the strongest way to span a given space. Corrugated fiberboard applies this same principle to paper.



GREEN

The term “Green” means a lot of different things within the category of foodservice disposables. It might refer to various grades of plastics, glass or aluminum containers that are recyclable or perhaps a consolidation of products into one container or green could also be packaging that is made of a material that can be composted. It’s important to clarify that “biodegradability” and “compostability” should not be interchanged or implied to mean the same thing, because they are not. A plastic material that can be classified under current standards to be compostable is then also biodegradable; however, not all biodegradable plastics, by current definition, are commercially compostable. The material used might be safe for the environment, but it might take a longer period of time to decompose and require additional steps that are outside of the ASTM-D6400 composting requirements. The definitions of these two key terms are as follows:

BIODEGRADABLE The American Society for Testing Materials (ASTM) defines biodegradable as “*capable of undergoing decomposition into carbon dioxide, methane, water, into organic compounds, or biomass in which the predominant mechanism is the enzymatic action of microorganisms, that can be measured by standardized tests, in a specified period of time, reflecting available disposal condition.*”

In regards to “green bioplastic” that is compostable, the ASTM definition changes to “biodegradability” which is determined by measuring the amount of CO2 produced over a certain time period by the biodegrading plastic. ASTM, ISO and DIN standards require 60% biodegradation within 180 days in order to qualify as a compostable “Green Plastic” substrate that meets ASTMD-6400 reqs.

COMPOSTABLE A mixture of decaying organic matter that can be used as fertilizer. In regards to “green” packaging that is compostable the ASTM definition changes to “A material is ‘compostable’ when it is biodegradable under composting conditions.”

To pass the ASTM tests, a **bio-plastic** must be:

- **Biodegradable:** Converted to carbon dioxide, water and biomass at the same rate as kraft paper and other compostable materials
- **Able to disintegrate:** Not be visible or need to be screened out after composting
- **Safe for the environment:** Degredation must not cause any harmful bi-products, and the compost must be able to support plant growth

GREEN

COMPOSTING STANDARDS AND ORGANIZATIONS

It can be very confusing as to what is and is not a certified compostable substrate or material? In fact, most city government officials, around the Western United States, do not even understand what is and is not truly a certified compostable substrate to allow into green composting waste streams. The next series of pages will help you understand the true Definitions, Standards, Organizations, and the "How to Compost" methods so that you can become more familiar with the process.

Standards - Listed below are a number of national and international composting and biodegradation standardization codes that define various compost testing processes.

AMERICAN SOCIETY FOR TESTING MATERIALS

ASTM D6866	*Test method for determining biobased content*
ASTM D6400	*Specifies material will fully biodegrade in a compost environment within 180 days. The US industrial composting standard for a single material or component such as a disposable fork*
ASTM D6691	*Test method for determining aerobic biodegradation of plastic materials in the marine environment by a defined microbial consortium or natural sea water inoculum*
ASTM D6868	*Specification for biodegradable plastic used on paper substrates. The US industrial composting standard for a product that includes a laminated or extruded film or coating. This is to account for coated products and ensure the materials remain compostable when additives are included, such as a coated paper plate*
ASTM D5338	*Test method Biodegradation of plastic materials under controlled composting conditions*
ASTM D7473	*Test method for weight attrition of plastic materials in the marine environment by open system aquarium incubations*
EN13432 and EN14995	*The European equivalent of the ASTM standards, defining regulations for compostable plastics.*
ISO15985	*International standard for products suitable for anaerobic biodegradation*
ISO17088	*International Standard for products compostable in industrial facilities*
N FT 51-800	*French standard for home composting*
AS4736 and AS5810	*Australian standards for industrial and home composting*

Organizations – There are a number of "Green" affiliated organizations, companies and associations that provide a 3rd party test on a variety of substrates and materials, some for a fee, in order to determine if the material will decompose in a compost windrow or commercial compost facility process and meet the FTC requirements for identifying the substrate or material as certified compostable. Some of these organizations are:

ASTM International – Stands for The American Society for Testing Materials and is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services. Based out of Pennsylvania ASTM standards are developed by committees of relevant industry professionals who meet regularly in an open and transparent process to deliver standards, test methods, specifications, guides, and practices.

BPI – (Biodegradable Products Institute) - A US based organization that officially certifies a variety of materials and substrates in order to determine if they meet ASTM D6400 and ASTM D6868 standards for commercial compost timeline requirements. It is a multi-stakeholder association of key individuals and groups from government, industry and academia, which promotes the use, and recovery of biodegradable polymeric materials

Cedar Grove - A leading compost facility based in Seattle, WA who uses their own unique GORE system which composts material under an enclosed tarp system that blows oxygen into the windrows to stir a faster decomposition timeline of typically 60 days.

CMA - The Compost Manufacturers Association field tests compostable products. They use different types of compost facilities to provide proof of that a material or substrate is in fact actually composting under varying conditions.

TUV OK Compost Home - Austrian certification for home compostable products.

Home Composting - There is not yet an international standard specifying the conditions for home composting of biodegradable plastics, nor is there a home composting standard in the USA. However, there is N FT 51-800 which is a French standard for home composting. Due to differences in climate and individual home compost bins, time to decompose may vary. The speed and efficacy of composting are largely determined by factors such as: local climate, season, carbon-nitrogen mix, and air circulation.

Do materials and substrates decompose under a landfill? Unfortunately, like regular food waste, compostable products will not compost in a landfill. Composting requires the correct combination of materials, oxygen, heat, and moisture. Landfills are inert, meaning the materials cannot break down under a landfill pile because there is no oxygen.

WHY IS COMPOSTING A GOOD THING?

Compostable Packaging is the most sustainable packaging the planet has to offer. Compostable packaging has a tangible impact at every stage of its lifecycle:

- It begins life as sustainably-sourced wood cellulose and other bio-plant based resins.
- During its life it is non-toxic packaging for both food and non-food products, ensuring that products are not damaged or wasted.
- At end-of-life it can be ground up, composted and then used to enrich the soil to grow something new.

What is also important to know is that not all bio-plastics and accepted food packaging is actually used in agriculture after it has been composted. Today's grocery store chains are reluctant to buy organic produce from farmers who are using bio-plastics in their composting facilities and then mixing it into their fields. The reason is that some bio-plastics are made from bio-based plants like domestically grown GMO corn. If GMO mixes into an agricultural farming field, that is supposed to be growing organic produce, then the farmer cannot legally call the produce organic. As a result, farmers are now pushing back on the commercial compost yards asking them to only send them compost that has no bio-plastics in the mix so that they can assure their grocery customers that their produce is truly grown organically. This has triggered a need to separate bio-plastics out of the organic mix of waste at a commercial compost facility where two separate windrows are now mixed. The organic windrow of compost is sold to the farmers for one price, and the bio-plastics windrow of compost is sold to golf courses, and landscapers who buy it at a different price for applications that do not include food sold to consumers.

GREEN

DEFINITIONS OF BIODEGRADATION

The term compost has been around for centuries. It's the simple process of biodegrading the appropriate natural materials into a compost pile so that bacteria (microorganisms), heat and oxygen begin to break down the matter into a humus fertiziler composition. The term "composting," or better yet, "Compostable" has become more popular today than ever, due to new legislation that is escalating the total yield of foodservice packaging waste into commercial, as well as residential, compost programs. Composting is yet another way to recycle and sustain a closed loop system of natural materials by decomposing it back into organic matter for use in a variety of agricultural applications.

During decomposition, the microorganisms require oxygen and water to thrive, so composters regularly turn the materials to aerate them to distribute water. Temperatures within compost piles can rise as high as 100° to 150° Fahrenheit.

The decomposition process can take as little as three weeks, depending on the material mix, or as long as three months, resulting in a stable, decomposed, organic material called humus. This carbon-rich, dirt-like substance is full of nutrients like nitrogen, phosphorus and potassium. It can be used for soil amendment, turf building, soil erosion control, fertilizer and even pest control.

WINDROW CROSS SECTION

FEEDSTOCK

Leaves

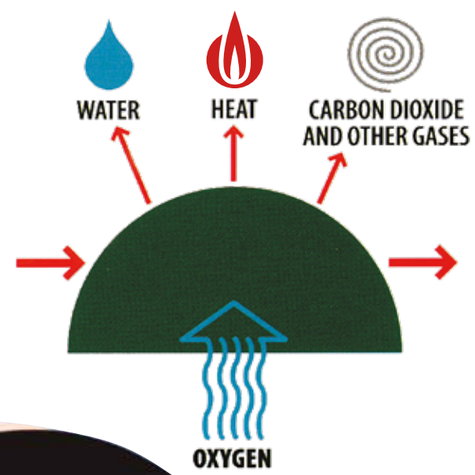
Grass clippings

Clean wood

Nitrogen

Water

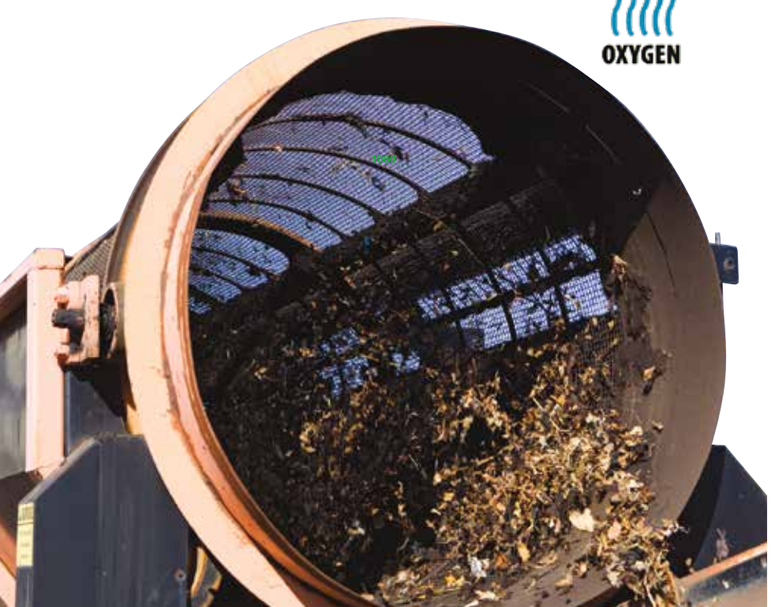
Soil



MATURE COMPOST

A uniform mixture of decomposed organic matter, minerals and microorganisms with reduced volume, weight and moisture content

SOURCE: wm.com



COMPOSTERS: WHAT DO THEY ACCEPT?

- Yard waste
- Paper
- Food scraps
- Compostable plastics
- Algae
- Bio-solids

GREEN

BIO-PLASTIC & BIO-MATERIAL CLASSIFICATIONS

BIO-MATERIAL NAME		WARM FOOD (MICROWAVE SAFE)	HOT FOOD (OVENABLE)	COLD FOOD (REFRIGERATOR SAFE)	FROZEN FOOD (FREEZER SAFE)	COMPOSTABLE	RECYCLABLE OR LANDFILL	MADE FROM A SUSTAINABLE SUBSTANCE
	PLA **POLYLACTIC ACID** MADE FROM PLANT STARCHES Food containers, cups, straws, portion cups, lids	NO	NO	YES	NO	YES*	(IF NOT COMPOSTED) LANDFILL	YES (MADE FROM PLANT STARCHES)
	POTATO RESIN **STARCH BLENDED COMPOUND** MADE FROM POTATOES Cutlery, clam shells, plates, meat trays, school trays	YES	NO	YES	NO	YES*	(IF NOT COMPOSTED) LANDFILL	YES (MADE FROM POTATOES)
	MATER-BI ECOVIO(FILM) Compostable bags, can liners	NO	NO	YES	NO	YES*	(IF NOT COMPOSTED) LANDFILL	YES (MADE FROM PLA & OTHER BIORESINS)
	**FIBROUS BOARD** MADE FROM BAGASSE/ BAMBOO/WHEAT FIBER Plates, clam shells, containers	YES	YES	YES	YES	YES*	(IF NOT COMPOSTED) LANDFILL	YES (MADE FROM BAGASSE/BAMBOO/ WHEAT FIBER)
	PAPER / LINER BOARD **PULP SHEETS & RIGID BOARD** MADE FROM TREES & RECYCLED PULP SUBSTRATES Cake boxes, clam shells, food trays, catering boxes	YES	NO	YES	YES	YES*	RECYCLABLE (LAMINATED BOARD MUST BE SEPARATED)	YES (MADE FROM TREES)
	MOLDED FIBER **PULP MATERIAL** MADE FROM RECYCLED NEWSPAPER AND MILK CARTON STOCK Plates, clam shells, containers, drink carriers	YES	NO	YES	YES	YES*	RECYCLABLE	YES (MADE FROM RECYCLED PULP)
	CPLA **CRYSTALIZED POLYLACTIC ACID** MADE FROM PLANT STARCHES AND OTHER BIO-ADDITIVES Food containers, cups, straws, portion cups, lids	NO	NO	YES	NO	YES*	(IF NOT COMPOSTED) LANDFILL	YES (MADE FROM PLANT STARCHES)
	BAMBOO Catering trays, plates, bowls, skewers, cutlery	YES	NO	YES	YES	YES*	(IF NOT COMPOSTED) LANDFILL	YES
	PHB & PHA	YES	NO	YES	YES	YES	(IF NOT COMPOSTED) LANDFILL	YES
	PALM LEAVES	YES (UP TO 2 MINS)	YES (UP TO 350°, UP TO 45 MINS)	YES	YES	YES	(IF NOT COMPOSTED) LANDFILL	YES

*If the material meets the ASTM-D6400 Requirements

THE TRUTH ABOUT "GREEN" BIOPLASTICS

The global bioplastics packaging market recorded a market valuation of more than $ 7.5 billion in 2021 and is expected to reach a value of $15.6 billion by the end of 2027. The unfortunate truth about bio-plastics is that most waste collection companies are not able to differentiate between traditional plastic and a bioplastic because they typically look the same in shape, color and design. Some industry statistics show that less than 1% of all bio-plastics actually make it to compost facilities.

Moreover, a number of commercial compost facilities reluctantly accept, or some do not accept bioplastics at all, due to the uncertainty of their bio-chemical composition. In some instances, organic farmers who buy compost fertilizer for their crops have lobbied commercial composters not to blend their organic compost matter with bio-plastics because of the "green washing" that occasionally happens with packaging companies that are eager to call their custom bio-blended compounds "compostable."

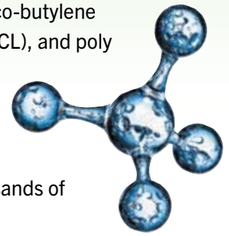
In addition, although bio-plastics do eventually decompose, most commercial composters typically don't shred the sometimes thick material into small pieces, and are financially driven to convert organic matter into fertilizer in as short of a period of time as possible. As a result, the compost facilities seek pulp-based or easily identifiable bio-plastics that have a green or a brown stripe on the product. Embossing "compostable" or having a green or brown stripe in some cities, is confirmation enough to the composters that the product is compostable and does meet the strict ASTM-D6400 decomposition timeline of less than 180 days. Some commercial compost facilities are able to decompose their organic matter in less than 60 days due to the process they use called the GORE system. This system uses heavy tarps, that are draped over the windrows, and oxygen is pumped underneath to accelerate the decomposition timeline. Most bio-plastics that do get composted are not used in agriculture due to their common GMO (Genetically Modified Organisms) compounds. Instead they are used in applications like landscaping.

The other popular view to bio-plastics is that the factories that make them are using materials that are from a renewable resource, like the sucrose from corn or the starch from potatoes. So even though there may not be an infrastructure of channels set up to collect, identify and compost bio-plastics in every region across the country, consumers seem to embrace the idea of a "green" material that is renewable or sustainable. Moreover, the trend to divert waste away from landfill and the continuing ban on select grades of plastics in more cities across North America may create a demand for more waste collection channels that will allow all "green" bio-plastics to be either recycled and or composted.

WHAT IS POLYHYDROXYBUTYRATE (PHB) AND POLYHYDROXYALKANOATES (PHA) – ARE THESE BIODEGRADABLE POLYMERS?

Polyhydroxyalkanoates (PHAs) are a family of bacterially synthesized biopolyesters with biodegradability, biocompatibility, thermoprocessibilty, and flexible strengths. Poly-(R)-3-hydroxybutyrate (PHB) was the first PHA discovered and has been the best-studied PHA member.[1] PHAs, as a raw material source, have found applications in the form of packaging materials including films, boxes, coating, fibers and foam materials, biofuels, medical implants, and drug delivery carriers.

Recently, there has been significant interest in bio-based degradable plastics owing to their potential as a green and sustainable alternative to synthetic plastics due to their biodegradable properties. Polyhydroxybutyrate (PHB) is a biodegradable polymer that is produced by bacteria and archaea as carbon and energy reserves. Due to its rapid degradation in natural environments, it can be considered a biodegradable plastic alternative. There are different types of biodegradable plastics, such as polylactic acid (PLA), poly (butylene succinate-co-butylene adipate) (PBSA), polycaprolactone (PCL), and poly (hydroxyalkanoates) (PHAs). These types of bio-plastics can be used to replace synthetic plastics, such as polyethylene (PE) and or polystyrene (PS), which require hundreds or thousands of years to degrade in the environment.



PHB is the only type of polymer that is fully biodegradable in nature. Bacteria can synthesize PHB as inclusion bodies that accumulate as reserve material when their growth is subject to several different stress conditions. This polymer exhibits properties that are similar to several synthetic thermoplastics, including polypropylene. The advantages of these types of biodegradable plastics are that they are useful for extensive applications and can be produced on a mass scale.

The high production costs of PHB in comparison with plastics derived from petrochemicals are one of the major problems for the extensive production and commercialization of this PHB bio-plastic product. However, PHB is helping scientists come up with new ways to reduce even the methane carbon emissions in our atmosphere and through science convert it into a raw material that can be used in manufacturing as a bio-resin to make sustainable products.

1 National Center for Biotechnology & Science Direct

PALM LEAVES

A relatively new bio-substrate are palm leaves from the jungles in Asia. Fallen palm leaves are picked up off of the ground and taken back to factories where they are steam cleaned, sterilized, reheated and shaped into plates, bowls and containers. Since there is nothing added to the leaves this substrate is also 100% compostable.

THE PROCESS

01 GATHER LEAVES
Fallen palm leaves are collected & brought to our factories in India.

02 STEAM & PRESS
The palm leaves are steamed & sterilized then pressed into shape.

03 HEAT
The palm leaves are heated to finish the product & retain their shape.

04 USE & ENJOY
The products are ready to display culinary creations & inspire new uses.

05 COMPOST
The products are BPI Certified compostable in an industrial facility or at home.

06 BACK TO THE EARTH
Soil containing compost enhances plant growth by 15%.

EXTENDED PRODUCER RESPONSIBILITY

Faced with increasing amounts of waste, many governments have reviewed available policy options and concluded that placing the responsibility for the post-consumer phase of certain goods on producers could be an option. Extended Producer Responsibility (EPR) is a policy approach under which producers are given a significant responsibility – financial and/or physical – for the treatment or disposal of post-consumer products. Assigning such responsibility could in principle provide incentives to prevent wastes at the source, promote product design for the environment and support the achievement of public recycling and materials management goals. Within the OECD the trend is towards the extension of EPR to new products, product groups and waste streams such as electrical appliances and electronics.

OECD has been doing much work on EPR, previously under the auspices of the Working Party on National Environmental Policies, currently under the auspices of the Working Party on Resource Productivity and Waste.

Like for other policy approaches, a careful assessment of the related costs and benefits of EPRs is important. The document Analytical Framework for Evaluating the Costs and Benefits of Extended Producer Responsibility Programmes provides detailed information on how to carry-out such assessments.

One of the aims when introducing EPR schemes has often been to give producers an incentive to change product design in environmentally benign ways, for example by making it easier to reuse or recycle the products. The report EPR Policies and Product Design: Economic Theory and Selected Case Studies discusses the theory behind this argument and analyses some selected cases. The report Instrument Mixes Addressing Household Waste also provides some discussion of the use of EPR schemes.[1]

1 "Https://Www.Oecd.Org/Env/Tools-Evaluation/Extendedproducerresponsibility .Htm ." Extended Producer Responsibility, https://www.oecd.org/env/tools-evaluation/extendedproducerresponsibility.htm . Accessed 26 Apr. 2022.

EXTENDED PRODUCER RESPONSIBILITY

Updated Guidance for Efficient Waste Management

This report updates the 2001 Guidance Manual for Governments on Extended Producer Responsibility (EPR), which provided a broad overview of the key issues, general considerations, and the potential benefits and costs associated with producer responsibility for managing the waste generated by their products put on the market. Since then, EPR policies to help improve recycling and reduce landfilling have been widely adopted in most OECD countries; product coverage has been expanded in key sectors such as packaging, electronics, batteries and vehicles; and EPR schemes are spreading in emerging economies in Asia, Africa and South America, making it relevant to address the differing policy contexts in developing countries. In light of all of the changes in the broader global context, this updated review of the guidelines looks at some of the new design and implementation challenges and opportunities of EPR policies, takes into account recent efforts undertaken by governments to better assess the cost and environmental effectiveness of EPR and its overall impact on the market, and addresses some of the specific issues in emerging market economies.

HOW DOES LEED HELP WITH GREEN?

LEED, or Leadership in Energy and Environmental Design, is the most widely used green building rating system in the world. LEED provides a framework for healthy, efficient, carbon and cost-saving green buildings. LEED certification is a globally recognized symbol of sustainability achievement and leadership.

HOW LEED WORKS

LEED certified buildings save money, improve efficiency, lower carbon emissions and create healthier places for people. They are a critical part of addressing climate change and meeting ESG goals, enhancing resilience, and supporting more equitable communities.

To achieve LEED certification, a project earns points by adhering to prerequisites and credits that address carbon, energy, water, waste, transportation, materials, health and indoor environmental quality. Projects go through a verification and review process by GBCI and are awarded points that correspond to a level of LEED certification: Certified (40-49 points), Silver (50-59 points), Gold (60-79 points) and Platinum (80+ points).

LEED SYSTEM GOALS

The goal of LEED is to create better buildings that:

- Reduce contribution to global climate change
- Enhance individual human health
- Protect and restore water resources
- Protect and enhance biodiversity and ecosystem services
- Promote sustainable and regenerative material cycles
- Enhance community quality of life

LEED is a holistic system that doesn't simply focus on one element of a building such as energy, water or health, rather it looks at the big picture factoring in all of the critical elements that work together to create the best building possible. In fact, 35% of the credits in LEED are related to climate change, 20% of the credits directly impact human health, 15% of the credits impact water resources, 10% of the credits affect biodiversity, 10% of the credits relate to the green economy, 5% of the credits impact community and 5% of the credits impact natural resources. In LEED v4.1, a majority of the LEED credits are related to operational and embodied carbon.[1]

1 "LEED Rating System | U.S. Green Building Council." LEED Rating System | U.S. Green Building Council, www.usgbc.org, https://www.usgbc.org/leed#:~:text=Green%20building%20leadership%20is%20LEED,of%20sustainability%20achievement%20and%20leadership. Accessed 28 Apr. 2022.

BACTERIA

Bacterial diseases include any type of illness caused by bacteria. Bacteria are a type of microorganism, which are tiny forms of life that can only be seen with a microscope. Other types of microorganisms include viruses, some fungi, and some parasites. Millions of bacteria normally live on the skin, in the intestines, and on the genitalia. The vast majority of bacteria do not cause disease, and many bacteria are actually helpful and even necessary for good health. These bacteria are sometimes referred to as "good bacteria" or "healthy bacteria." Harmful bacteria that cause bacterial infections and disease are called pathogenic bacteria. Bacterial diseases occur when pathogenic bacteria get into the body and begin to reproduce and crowd out healthy bacteria, or to grow in tissues that are normally sterile. Harmful bacteria may also emit toxins that damage the body. Common pathogenic bacteria and the types of bacterial diseases they cause include:

- **Escherichia coli and Salmonella** cause food poisoning.
- **Helicobacter pylori** cause gastritis and ulcers.
- **Neisseria gonorrhoeae** causes the sexually transmitted disease gonorrhea.
- **Neisseria meningitidis** causes meningitis.
- **Staphylococcus aureus** causes a variety of infections in the body, including boils, cellulitis, abscesses, wound infections, toxic shock syndrome, pneumonia, and food poisoning.
- **Streptococcal bacteria** cause a variety of infections in the body, including pneumonia, meningitis, ear infections, and strep throat.

Bacterial diseases are contagious and can result in many serious or life-threatening complications, such as blood poisoning (bacteremia), kidney failure, and toxic shock syndrome. Bacterial diseases are caused by harmful bacteria (pathogenic bacteria). The vast majority of bacteria do not cause disease, and many bacteria are actually helpful and even necessary for good health. Bacterial diseases occur when pathogenic bacteria get into an area of the body that is normally sterile, such as the bladder, or when they crowd out the helpful bacteria in places such as the intestines, vagina or mouth. Less common, bacterial infections can occur when healthy bacteria multiply uncontrollably.

VARIOUS WAYS PATHOGENIC BACTERIA CAN ENTER THE BODY

Pathogenic bacteria can enter the body through a variety of means including:

- Contamination of bites, cuts, rashes, abrasions and other breaks in the skin, gums and tissues
- Eating contaminated food
- Getting bitten by an infected insect
- Having sexual contact with an infected person
- Inhaling contaminated air-borne droplets into the nose and lungs
- Kissing an infected person
- Sharing needles for tattooing or drug use
- Through the eyes, ears or urethra
- Touching infected feces or body fluids, and not washing your hands before eating or touching your mouth, eyes or nose

Once bacteria enter the body, a healthy immune system will recognize the bacteria as foreign invaders and try to kill or stop the bacteria from reproducing. However, even in a healthy person, the body is not always able to stop the bacteria from multiplying and spreading. As the harmful bacteria reproduce, they can crowd out healthy bacteria and microorganisms and emit toxins that damage the cells of the body.[1]

1 SOURCE: Healthgrades.com

HACCP

WHAT IS HACCP?

Have you ever had food poisoning stemming from a restaurant you ate at earlier that day? In cases food poisoning can even lead to death. The U.S. Government's department of Food & Drug Administration or the FDA has a safety protocol plan that is referred to as HACCP, which stands for Hazard Analysis Critical Control Points, and is an internationally recognized method of identifying and managing food safety related risk. When a foodservice operation applies a tailored HACCP plan to an active food safety program it provides trust and assurance to the public and to the FDA that a food safety program is being well managed. HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product.

> Today, many of the world's best manufacturers and vendors use the system as a basis for their food safety management programs and for compliance. A food safety program, however, does not just stop with HACCP. To be effective, prerequisite programs such as pest control, traceability, recall, hygiene and sanitation need to be developed and implemented. Additionally, the issue of ensuring that suppliers and distributors also have a food safety program needs to be addressed through development of ingredient specifications and a vendor assurance system.

WHY IS HACCP IMPORTANT?

Proper implementation of a HACCP program helps reduce the likelihood of customer complaints or a recall by identifying and controlling potential hazards which may come from raw materials, facility processes, and human error. The greater employee awareness that results from a HACCP program helps to drive continual improvement of a company's products and processes.

Additionally, the HACCP principles are in alignment with the requirements of the FDA's Food Safety Modernization Act (FSMA) rule for food processors — Hazard Analysis and Risk-based Preventive Controls ("HARPC" or "Preventive Controls"). Although a HACCP plan does not meet all of the requirements, it meets the majority of the requirements and is the best platform from which to build a FSMA-compliant management system.[1]

The HACCP system can be used at all stages of a food chain, from food production and preparation processes including packaging, distribution, etc. The Food and Drug Administration (FDA) and the United States Department of Agriculture (USDA) require mandatory HACCP programs for juice and meat as an effective approach to food safety and protecting public health. Meat HACCP systems are regulated by the USDA, while seafood and juice are regulated by the FDA.

HACCP itself was conceived in the 1960s when the US National Aeronautics and Space Administration (NASA) asked Pillsbury to design and manufacture the first foods for space flights. Since then, HACCP has been recognized internationally as a logical tool for adapting traditional inspection methods to a modern, science-based, food safety system. Based on risk-assessment, HACCP plans allow both industry and government to allocate their resources efficiently by establishing and auditing safe food production practices. In 1994, the organization International HACCP Alliance was established,

1 SOURCE: SAFE ALLIANCECE.COM

initially to assist the US meat and poultry industries with implementing HACCP, and now its membership has been spread over other professional and industrial areas.

Hence, HACCP seeks to plan out unsafe practices based on science, differs from traditional "produce and sort" quality control methods that do nothing to prevent hazards from occurring and must identify them at the end of the process. HACCP is focused only on the health safety issues of a product and not the quality of the product, yet HACCP principles are the basis of most food quality and safety assurance systems. In the United States, HACCP compliance is regulated by 21 CFR part 120 and 123. Similarly, FAO and WHO published a guideline for all governments to handle the issue in small and less developed food businesses.

FOODSERVICE GLOVES

There are a variety of different types of disposable gloves that are used in the foodservice industry primarily for preparing food, practicing food safety and especially working with chemicals. The different classification of disposable gloves are as follows:

Synthetic (Neoprene) Gloves: are made from a synthetic rubber with a high chemical and heat resistance.

Neoprene Gloves: A synthetic rubber glove material resistant to oil, heat, and weathering.

Nitrile Gloves: are manufactured using synthetic latex, contain no latex proteins, and are three times more puncture resistant than natural rubber. They offer superior resistance to punctures and abrasions and are also used for protection against a variety of chemicals. Nitrile material also has a naturally low coefficient of friction, making these gloves easy to put on.

Latex Gloves: a latex glove is made from natural rubber latex and is a processed plant product. Latex gloves are the most flexible and resilient with a consistent fit. They are a great barrier protection against infection and contamination. These gloves are available in Powdered or Powder-Free, as well as Exam or General Purpose.

Polyurethane (Poly) Gloves: A synthetic material with high abrasion resistance. It is chemical resistant and very flexible. Polyurethane offers the elasticity of rubber combined with the toughness and durability of metal. Urethanes have better abrasion and tear resistance than rubbers while offering more strength. Polyurethane offers excellent wear properties, flexibility and elastic memory. It is resistant to oils, solvents, fats, greases and gasoline. Polyurethane will remain flexible down to -90°F and in hot water up to 175°F.

PVC (Polyvinyl chloride, known as Vinyl) Gloves: protect against a broad range of low hazard chemicals. PVC has high strength, good weather resistance and retains its shape. It is non-toxic and has good electrical insulating properties.

GLOSSARY OF TERMS

These are terms that you will encounter when discussing gloves. Call us when you encounter a term that you don't find in this list or that requires clarification.

Abrasion Resistance: A glove's durability against wear.

Allergen Content: Measure of glove's known allergy issues relating to its construction.

Ambidextrous: Gloves that can be interchangeably used on left or right hand.

Barrier Integrity/Protection: Glove's ability to serve as a protective barrier for a worker.

Chemical Resistance: A glove's ability to resist a specific substance agent.

Chlorination: Cleaning of gloves to provide fewer allergic reactions by lowering protein levels; process also makes "slicker" gloves that are easier to don.

Cuff: Bottom fabric of a glove, designed for wrist protection.

Curing: Also called vulcanization. Compound strengthening of glove material using heat or chemicals.

Cut Resistance: A glove's ability to protect a worker from sharp objects.

Degradation: Material breakdown in a glove, from frequent use or exposure to the elements.

Dipped Gloves: Unsupported gloves manufactured by submerging a ceramic mold into a polymer. Coated gloves are created using a fabric stretched over a mold and then polymer dipped.

Don: Act of inserting a hand into a glove.

Donning Powder: Added to gloves to ease donning and enhance comfort of glove.

Elasticity: A glove's ability to stretch and return to its natural form. Also called "Elongation".

GLOSSARY OF TERMS CONTINUED

Flock Lined Gloves: Gloves incorporating an inner liner to improve comfort.

Foam Lining: Internal polyurethane layer generally covered by fleece or flocked-lined with nylon to provide added warmth.

Form, Feel, and Comfort: Define overall fit, comfort and dexterity provided by the glove.

Fourchette: Additional sidewall area between top and bottom of glove fingers.

Former: Hand mold that is dipped into a polymer compound to shape the glove.

Full Lining: Two layers of protection or a "glove within a glove".

Gauntlet Cuff: Wide band of bonded material sewn to glove as a cuff for extra protection. Design facilitates quick removal of gloves.

Glove Memory: A glove's potential to form to user's hand, providing maximum comfort and reduced fatigue.

Latex Allergy: Reactions caused in some people by contact with natural rubber latex.

Leaching: Process of cleaning latex gloves to lower potential for latex allergy.

Low Protein: Gloves proven to contain less than 50u grams of protein, the minimum allowable claim by FDA.

Mil: Metric measurement used to determine glove thickness. 1 mil = 1/1000 inch.

Nap: Woven fibers, which appear "fluffy" in fabric gloves.

Nomex®: Nomex® (styled NOMEX) is a registered trademark for flame resistant meta-aramid material developed by DuPont. Nomex® is commonly used in industrial workwear and gloves.

OSHA: The Occupational Safety and Health Administration is an agency of the United States Department of Labor with the mission of preventing work-related injuries, illnesses, and occupational fatality by issuing and enforcing standards for workplace safety and health.

Plasticizers: Chemical components added to synthetic gloves to modify form, fit and function.

Pinhole Test: Quality control test to determine leakage in a glove.

Polyethylene: Synthetic glove material created through polymerization of ethylene.

Polymer: Synthetic material used as a coating on gloves, such as PVC, vinyl, neoprene, nitrile or rubber.

Powdered: A glove that is dusted with corn starch for moisture absorption and easy donning.

Protein Content: Refers to quantity of protein in latex rubber. Higher protein content in gloves can contribute to latex allergy.

Puncture Resistance: A glove's resistance to sharp objects.

Resistance: Glove's ability to shield user from chemicals or adverse work environments.

Rolled Bead Cuff: Reinforced cuff formed by rolling material up into thicker band at base of glove.

Rubberized Cuff: Water-resistant cuff common in gauntlet and safety gloves. Two layers are bonded together with special rubber-based adhesive.

Safety Cuff: Wide band of bonded material sewn to glove as a cuff. Gloves with safety cuff Safety-cuff are designed for rapid removal.

Tactile Sensitivity: Glove's ability to provide dexterity and a realistic feel.

Tensile Strength: Glove's resistance to tearing when stretched.

Texture: Finish to glove palm that allows for improved grip.

WHY DO LATEX GLOVES CAUSE RASHES?

The reason is because latex is a natural material that is extracted from the rubber trees typically found in Malaysia and South East Asia. There are proteins in the rubber that, when tightly pressed up against skin, can cause a rash on some people. As a result, many foodservice operators have transitioned away from using latex gloves for this reason and have migrated instead to using PVC (vinyl) gloves which do not harbor any natural proteins.

LATEX GLOVE BAN
RETAIL FOOD FACILITIES
SENATE BILL (SB) 677 (ALLEN 2019)

Effective January 1, 2020, Senate Bill (SB) 677 – California's Latex Glove Safety Law prohibits the use of latex gloves or utensils in all food service operations and retail food facilities. SB 677 requires food facilities to provide food workers non-latex gloves, scoops, forks, tongs, paper wrappers, or other non-latex utensils for food preparation and service. Recommended alternatives include nitrile, vinyl or polyethylene gloves, non-latex utensils and deli tissues.

Under the California Retail Food Code (Cal Code) food workers are required to minimize bare hand contact during food preparation or when handling non-prepackaged ready-to-eat foods by using an appropriate utensil or through the use of gloves. Glove use is also required under Cal Code for food workers if the worker has cuts, sores, or a rash that could be in contact with food or other food-related items. Although the use of gloves can help keep food safe by creating a barrier between hands and food, the use of latex gloves to prepare or handle food has shown to cause severe allergic reactions in certain sensitized individuals.

Consumers who are sensitized to latex can be at risk if they consume food that has been handled by workers wearing latex gloves. Recent reports indicate that up to 6% of the general population are sensitized to natural rubber latex. Latex allergies can be triggered by simply touching a product containing latex, or through inhaling airborne latex protein particles, or by consuming a food product that has been handled or prepared in contact with latex gloves. Additionally, those food workers, who repeatedly use latex gloves may also be at risk of developing sensitivity to latex which could result in their becoming allergic to latex products.

Latex allergies can produce a variety of symptoms including skin redness, hives, itching, runny nose, sneezing, itchy eyes, scratchy throat, and asthma. Symptoms may occur within minutes of exposure to latex or in the case of allergic skin reactions, take up to two days to become evident. While many cases are mild, in severe cases exposure to latex may result in anaphylactic shock, a life-threatening condition that has a rapid onset and may cause death.

For more information or regulatory oversite inquiries, please contact your local environmental health agency.

California Department of Public Health • Food and Drug Branch • (916) 650-6500 • fdbinfo@cdph.ca.gov

GLOVES

DESCRIPTIONS, TYPICAL USES & APPLICATION

POLY GLOVES					VINYL GLOVES	SYNTHETIC GLOVES	LATEX GLOVES	NITRILE GLOVES	LATEX FINGER COTS	REUSABLE GLOVES	
ValuGards Disposable Poly Gloves • Economical import, disposable glove • Perfect for price conscious customers on tight budgets • Reliable performance for short use applications • Straight cuffs, wrist length	Poly Disposable Gloves • "Loose fit" design for easy on/easy off use • Recommended for light tasks such as salad and sandwich prep • Perfect when frequent glove changes are required • Ideal for fast food and buffet serving lines • Hot-cast embossed low density polyethylene	Elbow Length Disposable Gloves • "Loose fit" design for easy on/easy off use • Elbow length, perfect for mixing salads and other foods • Perfect when frequent glove changes are required • Hot-cast embossed polyethylene • Cool, soft, and comfortable	Stretch Poly Disposable Gloves • Poly Stretch gloves offer all the benefits of our standard Poly gloves but with a form fitting design • Improved dexterity, touch sensitivity, and latex free • Stretch glove are a great alternative to vinyl gloves.	Quickserve™ Disposable Gloves • "Loose Fit" design for easy on/easy off use • Recommended for light tasks such as salad and sandwich prep • Perfect for when frequent changes are required • Ideal for fast food and buffet serving lines	Vinyl Disposable Gloves • Ideal for general food service use • Slightly less tight fitting than latex • Offers improved dexterity and touch sensitivity over looser fitting low density polyethylene gloves • Available powder free (PF) or lightly powdered with non-allergenic modified corn starch	Synthetic Disposable Gloves • A cost effective alternative to latex gloves • Non-allergenic, non-irritating, and non-toxic • Slightly tighter fit than vinyl • Perfect for general food service applications when infrequent glove changes are required • UltraTouch™ Gloves are the latest in glove engineering • Available powder free (PF) or lightly powdered with non-allergenic modified corn starch	Latex Disposable Gloves* • Ideal for food service use, housekeeping, industrial clean rooms, and assembly areas • Latex gloves provide snug comfortable fit, improving dexterity and touch sensitivity • Recommended for tasks, such as slicing or chopping • Available powder free (PF) or lightly powdered with non-allergenic modified corn starch	Nitrile Disposable Gloves • A premium replacement to Latex gloves • Great elasticity and performance with no latex allergies • Nitrile gloves are perfect for general foodservice applications • Only available in powder free (PF) • Non-irritating, and non-toxic	Latex Finger Cots* • Excellent fingertip dexterity • Fingertip protection unrestricted movement • Powder-free latex	Nitrile Reusable Gloves • Heavy-duty, regular and extra long elbow length gloves perfect for sanitary maintenance • Ideal for tough scouring of deep fat fryers, broilers, and rotisseries • Clean cooking surfaces, scrub pots and pans, scour ranges, grills, and ovens • Excellent for sanitary maintenance tasks such as cleaning outside dumpsters, cleaning receptacles, and scrubbing cement platforms • Each pair is packaged in a poly bag Neoprene Gloves • Puncture resistant (NOT PUNCTURE PROOF) • Strong leak proof gloves • Chemical resistant glove • Impermeable to liquids and oils	Cut Resistant Washable Gloves • Helps keep food service personnel safer around knife blades, sharp edges, and meat slicers • Provides exceptional grip, dexterity, and personal cut protection • Made of highly engineered seven gauge composite fibers Latex Reusable Gloves • Perfect for light to medium-duty janitorial chores and housekeeping tasks • Ideal for general scrubbing, scouring, and pot scrubbing • Flock lined for added comfort and long-term use • Available in yellow or orange • Each pair is individually poly bagged

** These products contain natural rubber latex which may cause allergic reactions in some individuals. Users who are sensitive to latex should avoid contact and consider alternatives. If an allergic reaction occurs, discontinue use, avoid further contact with this product and consult a physician*

TYPICAL USES AND APPLICATIONS

POLY GLOVES	PVC/VINYL GLOVES	SYNTHETIC GLOVES	LATEX GLOVES	NITRILE GLOVES	FINGER COTS	REUSABLE GLOVES
• Perfect for fast food & buffet serving lines • Recommended for light tasks such as salads and sandwich prep when frequent glove changes are required • Great for quick service operations such as bakeries and delis • Most economical	• Cost effective alternative • The most economical tight fitting glove with a cuff • All around medium service use • Available in exam grade	• Great alternative to vinyl gloves with better dexterity over looser fitting poly and vinyl gloves • Available in 3 different colors • Soft and supple to reduce hand fatigue and superioir durability that outperforms latex and vinyl	• Good for food service • Housekeeping • Industrial • Assembly areas • Available in exam grade	• When an INDUSTRIAL glove is needed used by law enforcement, mechanics and maintenance • Tight fitting, puncture resistant (not puncture proof) • Best in food service where durability and grip are important • Latex alternative • Available in exam grade • Available in 4 different colors	• Protect skin from exposure • To isolate an injured finger	• Reusable gloves are ideal for scrubbing and scouring pots and pans • Heavier reusable nitrile gloves are ideal for tougher jobs • Cut-Resistant gloves offer superior abrasion resistance • These gloves are designed to be cut resistant, not cut proof

FOODSERVICE INDUSTRY MYTHS & FACTS

Every day, people enjoy prepared foods and beverages using safe and sanitary foodservice packaging. There a lot of myths about foodservice packaging going around which are actually not true. As they rely more on these products — thanks to their on-the-go lifestyles — there's more attention on those paper and plastic cups, take-out containers and other single-use items. Sometimes, however, information being shared is either outdated or inaccurate. The Foodservice Packaging Institute has collected some of the most common myths about foodservice packaging and provided more factual information.

MYTHS AND FACTS

LITTER AND MARINE DEBRIS, DISPOSAL/RECYCLING/COMPOSTING, MATERIALS USED IN FOODSERVICE PACKAGING

SOURCE: Foodservice Packaging Institute

1

MYTH The Great Pacific Garbage Patch is the result of plastic packaging, including bottles and straws.

FACT Not at all. According to a 2018 study published in Scientific Reports, fishing nets account for 46 percent of the trash in the Great Pacific Garbage Patch. Most of the remaining garbage is composed of other gear from the fishing industry, including ropes, oyster spacers, eel traps, crates and baskets.

2

MYTH Plastic straws are one of the most common items found on beaches.

FACT That's actually true. According to Ocean Conservancy's 2018 International Coastal Cleanup report, straws ranked #7 in the top 10 list of items found on beaches around the globe, making up about 3% of total trash found during beach cleanups. Regional differences may be seen: in the U.S., straws came in #5; #6 in Canada; #8 in the UK and #10 in Hong Kong.

3

MYTH Americans use 500 million plastic straws a day, and they end up in the oceans.

FACT According to multiple sources, the estimate of 500 million straws a day is incredibly inflated. Cut that number in half, and that's closer to a more realistic estimate. As for the notion that most straws end up in the ocean, that doesn't even make sense, considering the geography of the U.S. and Canada. The vast majority of straws end up in landfills, and while that is not ideal, it's better than being improperly disposed on land or in waterways.

4

MYTH Our love affair with singleuse items plays a major role in the global marine debris problem.

FACT Not even close. According to the report "Plastic Waste Inputs from Land into the Ocean" published in Science in 2015, over half of all marine debris comes from six Asian countries: China, Indonesia, the Philippines, Vietnam, Sri Lanka and Thailand. The U.S. came in 20th on the list, and Canada was 112th. Similarly, the 2017 study "Export of Plastic Debris by Rivers into the Sea" published in Environmental Science and Technology found that 10 rivers are responsible for roughly 90 percent of the global input of plastic into the sea. These rivers include the Yangtze, Yellow, Hai, Pearl, Amur, Mekong, Indus and Ganges Delta in Asia, and the Niger and Nile in Africa.

5

MYTH Cups and take-out containers made from foam polystyrene (frequently, but incorrectly, referred to as "Styrofoam") are commonly littered items.

FACT According to Keep America Beautiful's 2009 "National Visible Litter Survey," foam foodservice packaging didn't even make the Top 10 list of items littered on U.S. roadways.

6

MYTH Banning single-use items like foam cups and take-out containers will reduce litter.

FACT Bans simply change the composition of litter streams, not reduce it. San Francisco conducted litter audits before and after they banned foam polystyrene foodservice packaging in 2008. The audits showed a reduction of approximately 30 percent in littered foam cups, but a roughly 30 percent increase in littered paper cups.

7

MYTH Requiring the use of compostable foodservice packaging will reduce litter.

FACT Compostable foodservice packaging will not degrade and magically disappear when littered. These items are designed to compost in a managed facility over several months — not in your backyard, on the sides of roadways or in waterways. And, since these items may be on the road for an extended period of time if littered, it may lead to more litter. Keep American Beautiful's 2009 "Littering Behavior in America" study found that litter begets litter — the mere presence of litter encourages additional litter.

8

MYTH Foodservice packaging is overrunning our landfills because of high usage and its inability to break down.

FACT First, almost nothing breaks down in a landfill. Landfills were designed to entomb materials. Their lack of air, water and light means items are buried and never degrade. Second, very little of what is sent to landfills is foodservice packaging. According to the U.S. Environmental Protection Agency's annual waste characterization studies, paper and plastic foodservice packaging accounts for less than 2 percent of materials discarded by weight.

9

MYTH Plastic bags can't be recycled.

FACT Plastic bags can be recycled, but they shouldn't be placed in curbside bins because they can damage the equipment in recycling facilities. Instead, plastic bags should be deposited at special drop-off locations like grocery stores, where the bags will be collected and recycled separately. For more details, go to www.plasticfilmrecycling.org.

10

MYTH Paper cups can't be recycled.

FACT Paper cups can be recycled, but in limited locations. Work is ongoing with communities, recycling facilities and paper mills to expand the opportunities to collect and process these materials and recycle them into things like tissue, toilet paper cores and pulp used to make new cups. For more details, go to www.recyclefsp.org.

11

MYTH Foam cups and containers can't be recycled.

FACT Foam polystyrene cups and containers can be recycled, but in limited locations. Work is ongoing with communities, recycling facilities and plastic end markets to expand the opportunities to collect and process these items and recycle them into things like tape rolls, hangers and raw materials used to make new foam cups and containers. For more details, go to www.recyclefoam.org

12

MYTH Plastic straws can't be recycled.

FACT Now that's actually true (for now). While most straws are made out of a recyclable material (polypropylene), their small size and shape are not compatible with today's recycling facilities. Even if you can't recycle straws, please dispose of them properly in the trash — and not improperly on land or in waterways. Or, if they are made of a compostable plastic, please compost them.

13

MYTH Compostable foodservice packaging doesn't actually compost — or there's no place to compost it.

FACT Compostable foodservice packaging made from paper and plant-based plastics do indeed compost, but since each composter is different, composters will want to double check the compatibility of the packaging with their operations. As for places to compost foodservice packaging, the industry is working to expand the infrastructure to compost these valuable materials. For more details, go to www.recyclefsp.org or contact your local municipality to find out what can be composted in your area.

14

MYTH Chemicals can leach out of foodservice packaging and into the food or beverage being consumed.

FACT It's true that chemicals used in foodservice packaging may migrate into the foods or beverages. That's why organizations like the U.S. Food and Drug Administration and Health Canada review any chemicals that could possibly come in contact with foods. These regulators review the safety of the chemical and confirm that any migration is well below the allowable threshold.

15

MYTH Use of paper cups is leading to deforestation and killing the planet.

FACT Paper is typically made from trees, but the U.S. paper industry practices sustainable forestry and has a positive growth-drain ratio. This means that for every tree harvested, several more are planted or naturally regenerated in their place.

16

MYTH Fluorochemicals used in foodservice packaging, like fast-food wrappers and molded fiber take-out containers, are dangerous.

FACT Fluorochemicals are used in some of today's foodservice packaging to provide a grease or oil barrier. Consumers can be assured that before any chemicals are used in food packaging, they are tested thoroughly and reviewed by the appropriate regulatory agency, such as the U.S. Food and Drug Administration and Health Canada.

17

MYTH Plastics are made from oil, a non-renewable resource from halfway around the world.

FACT The vast majority of plastics in the U.S. are made using natural gas found in North America. For more details, visit the U.S. Energy Information Administration's website.

18

MYTH Styrene, found in foam polystyrene cups and containers, causes cancer.

FACT Styrene is actually a naturally occurring element and is found in many human bodies. That's because you can find styrene in commonly consumed foods, like strawberries, peaches, cinnamon, beef and coffee. It's also a byproduct of processing beer, wine and cheese. Styrene used in the manufacture of foam foodservice packaging has been reviewed by the U.S. Food and Drug Administration and other international regulatory agencies and has been found to be safe for its intended use. In addition, the levels of styrene found in foam cups and containers is more than 10,000 times below the safety limit set by the FDA. For more information, visit www.youknowstyrene.org.

As you weigh all of your options and process all of the information that has been provided in this materials guide, it's important to keep in mind that at the end of the day you need to make the best business decision that you can for your food applications, for your customers and for your bottom line. Going "Green" is difficult to define because it means something different to everyone. To some it might be changing out all of their non-compostable products to compostable options. To others it might be setting up a recycling program and or reducing the amount of waste that purges from your business. Not every city nor every state has the same ordinances, laws and regulations that restrict restaurants and other foodservice operations from using select grades of plastic, foam or other non-recyclable materials. Foam disposables are still a growing category throughout the majority of North America.

In other parts of the country there are cities that have banned all disposable rigid plastics, plastic bags and foam disposables. Not every foodservice operation needs the same products, nor do they have the same waste streams available to them for recycling and composting. **In the end, this guide is intended to educate you on your options on foodservice disposables, how they perform in various food applications, as well as help you understand their end of life destinations today, and how these materials are impacting our surrounding environments.** I certainly hope this guide provides you with the information that you need to make a decision on the foodservice packaging disposables that you feel are best for your business.

Please don't hesitate to call Nexus for help – Thank you.

CONTACT US

T 800.482.6088
F 510.567.1005
www.nexus-now.com

Scan QR code to download PDF

Written by: Chris Matson

8TH EDITION 2024