

## Recycling Plastic: Complications & Limitations

(651) 222-SORT (7678)  
[www.eurekarecycling.org](http://www.eurekarecycling.org)

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Plastic is light, easy to store and transport, comes in an endless variety of textures and shapes, and can hold almost anything. These properties make plastic attractive to manufacturers. Plastic is in almost everything we touch. It's used to make our clothes, cars, toys, and household products. Many of the food, health, and beauty products we enjoy come in plastic packaging.

Our mission is to reduce waste today through innovative resource management and to reach a waste-free tomorrow by demonstrating that waste is preventable, not inevitable.

Plastic may be convenient for manufacturers and consumers alike, but this convenience carries a significant cost. Plastic is made from petroleum and the production, consumption, and disposal of petroleum products contribute significantly to global warming and a host of other environmental and human health problems.

Plastics are complex chemical compounds with thousands of different varieties, and therefore much more difficult to recycle than simpler materials like glass, aluminum, or paper. In order for plastic to be recycled, it must be collected, sorted by exact type, kept clean, processed, and delivered to a manufacturer that has the intention and capacity to use the material to make a new product.

Despite promotion of plastic recycling, plastic production has outpaced recycling many, many times over in the past decade. While increased plastic recycling is one way to alleviate this problem, it has only limited potential to reduce the glut of plastic waste. Recycling alone cannot solve the complex problems associated with plastic.

### Resin Codes and Recycling Arrows Don't Equal Recyclability!

Almost all plastic products are imprinted with a resin code — a small number enclosed by the “chasing arrows” symbol. This code is misleading because it does not indicate whether or not something is recyclable. ***Anyone can put recycling arrows on anything, implying it is recyclable.*** In 1988, the Society of the Plastics Industry (SPI) created an industry-wide national system to identify resin types of different plastics. The code was not intended to be a guarantee to consumers that a given item bearing the code would be accepted for recycling in their community or that community recycling streams exist for all coded items. The resin code is used by the plastics industry to indicate the general type of chemical compound used to make the product. The resin codes are used mostly, but not exclusively, on disposable plastic packaging and single-use containers. Plastic dinnerware, pitchers, flatware, baby bottles, sippy cups, and other products do not always have a resin code.

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## Please...Bottles Only

Most communities only collect plastic bottles that are made with Polyethylene Terephthalate (PET) resin coded as a #1, and High Density Polyethylene (HDPE) coded as a #2 resin. This includes nearly all types of plastic bottles you can buy: water and soda bottles, laundry detergent bottles, milk jugs as well as bottles for shampoo, soap, saline solution, lotion, vitamins, aspirin, and more. Almost all plastic bottles are made with #1 or #2 plastic. This means if you have a plastic bottle (and maybe can't read the small number on the bottom) you can be nearly sure that if you put it in the recycling bin, it can be recycled.

Yogurt tubs (HDPE #2), deli-trays (PET #1), and other plastics with resin codes #3-7 are NOT recyclable in most programs. You may have heard of some recycling programs that collect all types of plastic, or your hauler may collect these items. In these programs, all those plastic items must be sorted from the bottles — a labor-intensive and costly job — and most of what is collected is sent

to a landfill or an incinerator because it can not be recycled. Just because you may have slipped them by and they were collected, does not mean they were recycled.

You can help make plastic bottle recycling more successful: Now that you know the difference between the types of plastics your community can and cannot recycle, don't try to "slip in" the tubs and trays with your bottles. If you have questions about what can be recycled, take a minute to call our recycling hotline (651) 222-SORT (7678). You can also flatten you bottles to save space in your recycling bin and recycling truck, which can save on trips to the recycling facility.







### Bottles anyone?

Unfortunately, we haven't even come close to collecting all the bottles we can recycle. Only a small fraction of plastic bottles are making their way into recycling bins. According to the Container Recycling Institute, an alarming 86% of plastic water bottles used in the United States become garbage or litter. That means 7 of every 8 water bottles end up as trash or litter.

### The Plastic Numbering System

Most plastic packaging is marked with a resin code to identify the basic type of chemical compound used in the product. This code is usually found on the bottom of the container.

	<b>Polyethylene Terephthalate</b> Soda and water bottles, cooking oil bottles, cleaners
	<b>High Density Polyethylene</b> Laundry detergent bottles, milk and juice jugs, shampoo bottles
	<b>Polyvinyl Chloride (PVC)</b> Plastic pipes, shrink wrap, a few food containers
	<b>Low Density Polyethylene</b> Wrapping films, produce bags, most plastic wrap
	<b>Polypropylene</b> Drinking straws, yogurt tubs, some bottles like syrup, most Rubbermaid
	<b>Polystyrene</b> Styrofoam cups, peanuts, to-go containers
	<b>Other (usually a mixture of resins)</b> Food containers, including polycarbonate used in baby bottles, "sport" water bottles, sippy cups. New bio-based plastics may also be labeled #7.

### What does the "neck" have to do with it?

Many recycling programs use the language "with a neck" or "screw top lids" to help residents understand that they cannot recycle containers that are not bottles, such as yogurt tubs, deli-trays and plastic to-go containers, even if they are marked with a #1 or #2. Bottles are "blow-molded," while plastic tubs are "injection-molded" and deli-trays are "stamp-molded." The different additives used in each process mean that these types of material cannot be mixed during recycling, even though they started with the same basic resins.

Providing an incentive for consumers to recycle their plastic bottles via a ‘bottle bill’ can help ensure that more plastic bottles are actually recycled. In Michigan, where residents are required to pay a deposit on plastic soda bottles and can return the bottle for the deposit once it is empty, 97% of the plastic bottles find their way to the recycling program. Water bottles in Minnesota are not subject to a deposit, and as a result, only 20% of all plastic water bottles are recycled. Clearly, providing an incentive to residents to recycle plastic bottles has a significant positive impact on the number of bottles that actually get recycled. Only 11 states in the nation have a bottle bill law. A state bottle bill in Minnesota and a national bottle bill have been proposed many times. To learn more about the benefits of a bottle bill, visit [www.container-recycling.org](http://www.container-recycling.org). Let your state elected officials know you want Minnesota to have a bottle bill.

### What happens to my recycled plastic bottles?

The markets for recycled plastic bottles were established over many years and continue to be stable and widespread. It is easy to confirm the products made from plastic bottles and the environmental conditions related to their remanufacture.

Most milk jugs, soda bottles, and water bottles are turned into lower-grade products such as fill, fleece, carpet, toys, or plastic lumber. This is why “downcycling” is a more accurate term than “recycling” when it comes to plastic. Unlike glass or aluminum, plastic recycling does not “close the loop” because most postconsumer bottles are not made into new plastic bottles even though the technology exists to do so. Instead, plastic bottles are made into products that are not in turn recyclable. Furthermore, plastic resin has limited ability to be recycled because its quality degrades every time it is reheated. When we collect and remanufacture plastic, we are only delaying its disposal. The final destination for all plastic is either in an incinerator, where it releases harmful chemicals to the air when burned, or in a landfill, where the byproducts of that plastic’s gradual deterioration can contaminate groundwater. Both pose risks to our health.

### Recycling alone cannot solve the problem

Most plastic products (with the exception of bottles) do not fit into the recycling system because they have not been designed to be recycled. For communities to create a recycling system to recycle every possible type of plastic packaging is not only daunting, expensive, and inefficient, it places all the responsibility and costs on the consumer.

### There are health concerns with plastics.

“A myriad of petroleum-based chemicals go into the manufacture of plastics. Some can leach into food and drinks and possibly impact human health. Leaching increases when plastic comes in contact with oily or fatty foods, if plastics are heated and from old or scratched plastic. Types of plastics shown to leach toxic chemicals are polycarbonate, PVC and styrene. This does not imply that other plastics are entirely safe. These plastics have just been studied more.” ~from [\*Smart Plastics Guide to Healthier Food Uses of Plastics\*](#) by the Institute for Agriculture and Trade Policy

Learn more about smart plastics choices for you and your family. Call our recycling hotline (651) 222-SORT (7678) to request the [\*Smart Plastics Guide\*](#), which will help you avoid the most harmful kinds of plastics, especially #3s, #6s, and some #7s.

Learn about efforts to require producers to take responsibility for harmful plastic projects. Visit [www.healthylegacy.org](http://www.healthylegacy.org) to learn about phasing out harmful plastic chemicals from children’s products. Request Eureka Recycling’s fact sheet about *Nalgene Bottles* to make sure your water bottle is safe.

Visit [www.grn.org](http://www.grn.org) for more about eliminating #3 or “vinyl” plastic used to package the health and beauty products you use.

For plastic recycling to work, communities must be able to cost effectively collect and sort plastic, and manufacturers must be willing to accept the material to make new products. Currently, only plastic bottles have the conditions that make recycling feasible. For many years, communities and recyclers have struggled to create recycling programs for other types of plastics with little success because of these issues:

**Collection is expensive.** Because plastic is light and bulky, it is difficult to efficiently gather significant amounts of the same types of plastic. Drop-off sites are sometimes used to reduce collection costs, but because of its ability to take up a lot of space, plastics are hard to cost-effectively collect.

**Extensive sorting is required.** Although there are only seven resin codes, there are thousands of different types of plastics. Different combinations of dyes and additives can be added to the basic resin to produce a desired color, shape and texture in the final product. These variations in the manufacturing process cause different melting points within the same resin code. To be made into another product, plastic must be carefully sorted by type. Combining different types of plastic renders it useless for manufacturing.

**Manufacturers do not have incentives to use recycled plastic.** In order for plastic to be recycled, there must be manufacturers who want to buy and use the plastic to make new products. For these manufacturers, it is often cheaper and easier to make plastic containers from new, clean, virgin plastic and there are few, if any, incentives for them to use recycled content. Over many years, the markets for bottles made with #1 and #2 plastics have become stable, verifiable, and widespread. However, markets for other types of plastics are few and far between and it has always been difficult, if not impossible, to verify what happens to these other types of plastics after their collection and sale. When markets for these items do exist, they are often sporadic and without the ability to handle significant amounts of material, making it difficult to rely on them over time. In recent years, a few markets for these materials have appeared (and disappeared) in this region. Most markets are located in countries with weak environmental controls, causing considerable harm to human health and the environment.

### **When will I be able to recycle yogurt tubs?**

No matter how many chasing arrows are printed on plastic products, it doesn't change the fact that plastic is largely a throwaway material. Most plastic products have a serious design flaw: they are produced to be disposable, not recyclable, reusable, or compostable. The ability to recycle a wider variety of plastic products on a consistent basis will only happen when the companies responsible for making these products bear the responsibility for designing their products and packaging to fit into the current system. In Canada and the European Union, for example, manufacturers are required to fit their products into a recycling or composting system, or create a system to recycle or compost their products, or pay a tax if they do not fulfill these requirements.

### **What about plastic bags?**

There's a great variety in bags that hold newspapers, plastic wrap for magazines, sandwich bags and many types of retail bags. Plastic bag recycling faces the same challenges of any plastic material: collection is costly, sorting is necessary and cost-intensive, quality and cleanliness are critical issues and hard to maintain. *It's in the Bag* is a Twin Cities-based plastic bag and film recycling program. For drop-off locations and details, visit: [www.itsinthebagmn.org](http://www.itsinthebagmn.org).

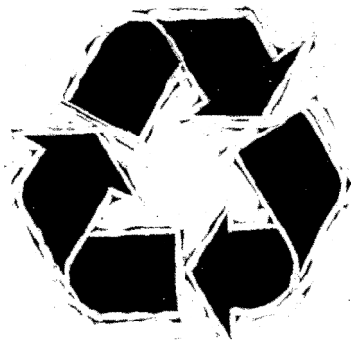
The only sustainable approach is to create producer responsibility that engages manufacturers in creating solutions. Requiring manufacturers to include recycled content in their plastic products will help drive the creation of the markets and infrastructure required for the successful expansion of plastics in recycling programs. This approach also requires the manufacturer to share in the costs associated with plastic recycling so that communities are not left alone to bear the expenses.

You can help address the problems associated with plastic products and packaging! Reduce the amount of plastic you consume by making smart purchasing choices. Look for products that come in little or no packing or in recyclable packaging, like glass, paper, or plastic bottles. Contact the manufacturers of your favorite products and ask them to correct the design flaws in the plastic products they choose to use—their toll free phone numbers and website address are usually printed right on the box.

### **Should I continue to recycle plastic bottles?**

Yes! When the options to dispose of the growing amount of plastic are incinerating it or burying it in a landfill—both of which release harmful chemicals into our air and water—trying our best to recycle as much plastic as we can has become the best alternative. Recycling plastic reduces the energy it takes to process and manufacture new goods. By replacing virgin plastic with recycled plastic we also reduce the need to extract new resources from the earth. Recycling also reduces the greenhouse gases that result from garbage and manufacturing.

You can make a difference by recycling! Be sure to recycle all the plastic bottles in your home, like shampoo bottles in the bathroom. You can also make a habit of bringing home bottles you use when you are on-the-go and recycle them at home.



### **Questions?**

Contact Eureka Recycling  
(651) 222-SORT (7678)  
[www.eurekarecycling.org](http://www.eurekarecycling.org).

You can learn more about the impact of recycling on climate change by reading [Recycling, Composting, and Greenhouse Gas Reduction in Minnesota](#) available online at [www.eurekarecycling.org](http://www.eurekarecycling.org) or by calling the Recycling Hotline at (651) 222-SORT (7678).