Slate

THE GREEN LANTERN

Thou Shalt Sort Thy Plastics

How bad is it to mix your soda bottles with your yogurt cups?

By Brendan I. Koerner

Posted Tuesday, May 6, 2008, at 7:34 AM ET

I've been tossing my used yogurt cups in the recycling bin for years. So imagine my horror when I recently got around to reading the fine print on my city's sanitation guidelines—yogurt cups, it turns out, are supposed to go in the regular trash. Has my inadvertent sorting error ruined many tons' worth of recyclable plastics?

No, there's hardly a need to flagellate yourself over such a minor environmental sin. Sure, you've been making life ever-so-slightly less pleasant for the hardworking employees of your local recycling facility—they exert considerable effort picking through incoming refuse. But your yogurt cups, which are probably made of polypropylene, won't cause much damage to the recycling stream itself. The same can't be said for items made of polyvinyl chloride, such as certain kinds of pipes and food containers. Mix those in with your empty soda bottles and you could be wreaking some serious havoc.

Your recycling center's distaste for yogurt cups is par for the course throughout the United States. Of the seven types of numbered plastics, only No. 1 (polyethylene terephthalate, or PET) and No. 2 (high-density polyethylene, or HDPE) are commonly recycled. Even in those rare municipalities that ask residents to throw all plastics in the same recycling bin, it's mostly just the PET (mostly in the form of beverage bottles) and HDPE (detergent bottles) that get processed. While it's technically feasible to recycle other plastics, the process is expensive and results in plastic that's widely deemed inferior. Products made from plastics No. 3 through No. 7—a range that includes food trays, grocery bags, six-pack rings, and your yogurt cups (designated No. 5)—are typically either landfilled or shipped overseas for incineration. (There's great interest in the developing world in burning plastics to recover the fossil fuels [PDF] from which they're made.)

When loads of plastic are dumped on a recycling facility's floor, the sorting fun begins. Workers often start by picking through the piles in search of obviously discordant items—kiddie play sets, lawn furniture, clothing mannequins. They also scan for plastic mounds that are drenched in nonrecyclable trash, such as food slurries or medical waste. While a little caked-on tomato sauce isn't going to ruin a batch of PET bottles, a Dumpster's worth of nonrecyclable garbage will; if a large apartment building was careless about separating its rubbish, then hundreds of pounds of plastics may have to be sent to the landfill. According to a 2005 Environmental Protection Agency study in the Pacific Northwest, 24 percent of plastic bottles were rejected as too contaminated for recycling. (By comparison, 14 percent of metal goods were rejected, and just 1 percent of newspapers.)

The remaining plastics are then sent along a conveyor belt, where they're sorted by hand—a hazardous task, given the prevalence of syringes and other dangerous surprises in the deluge. Workers mostly look for empty beverage bottles, which are the industry's version of gold nuggets—such bottles are almost always made out of PET, the most easily recycled plastic. This is likely the step in the process at which your erroneously sorted yogurt cups are picked out.

If your misplaced polypropylene slips past the human inspectors, however, it may get caught during the ensuing phase, when the machines go to work. Most use either X-rays or near infrared spectroscopy to analyze the

chemical properties of passing plastics. Items that register as either non-PET or non-HDPE are ejected from the sorting belt with jets of air. The best machines claim an accuracy rate of 98 percent; they are occasionally stymied when bottles are stuck together or excessively flattened. As a result, a final manual inspection is often necessary to verify that a load is free of any meaningful contaminants.

The nastiest of those potential contaminants isn't your polypropylene but rather PVC (aka plastic No. 3). Though it's increasingly rare in the United States due to concerns over dioxin emissions during manufacture, PVC is still prevalent enough to ruin many a load of otherwise recyclable PET. The stuff is the bane of recyclers everywhere: A single PVC bottle can irrevocably contaminate an entire 800-pound load of otherwise desirable PET, rendering it unfit to be made into new products—PVC forms acids when mixed with PET, and those acids can make the recycled plastic unacceptably fragile. Because of this danger, many recycling facilities now employ machines such as FlakeSort, which analyzes the PVC content of processed plastic "flakes" before they're sold on the open market.

Those flakes are rarely turned into new food-grade products but are "downcycled" into pipes, fence posts, and picnic tables—exactly the sorts of products that recycling facilities reject during their initial screenings. So when these post-consumer items are no longer wanted, they're ultimately destined for the landfill or for an incinerator in Guangdong Province.

Despite its labor-intensive and relatively inefficient nature, plastics recycling still makes long-term sense. The EPA estimates that making a ton of plastic out of used PET bottles saves 55.9 gigajoules of energy over manufacturing a ton of plastic from scratch. And in 2005, Britain's Waste Resources and Action Programme analyzed (PDF) 60 different life-cycle scenarios for plastics. The organization concluded that recycling was invariably superior to landfilling, in terms of net carbon emissions. Recycling was clearly preferable to incineration, meanwhile, in more than 76 percent of the scenarios. It bears noting, however, that the WRAP study doesn't seem to have factored in the energy used to transport plastics to overseas incinerators nor the possibility that those incinerators lack proper emissions safeguards. (Environmentalists fear that burning PVC, in particular, can lead to toxic emissions, and that even ostensibly safer plastics contain heavy metals in their pigments.)

The equation tilts more heavily in recycling's favor once you consider the recent rise in oil prices. About 8 percent of the world's oil supply goes toward making plastics—half into the actual feedstock and half to power the manufacturing plants. With crude futures currently hovering around $120 barrel, there's a lot of incentive for companies to figure out how to use recycled flakes in lieu of virgin plastic. If this trend continues, maybe they'll even start jonesing for your yogurt cups.

Is there an environmental quandary that's been keeping you up at night? Send it to ask.the.lantern@gmail.com, and check this space every Tuesday.

Brendan I. Koerner is a contributing editor at Wired *and a columnist for* Gizmodo. *His first book,* Now the Hell Will Start, *will be published by Penguin Press in May 2008.*

Article URL: http://www.slate.com/id/2190734/
