

# How printers keep us hooked on expensive ink

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# How printers keep us hooked on expensive ink

*Manufacturers lock us into buying ink cartridges at exorbitant prices. Printers don't have to suck, we've identified some simple steps to end the ink trap.*

Printer ink is sold at an absurd markup. Black printer ink purchased wholesale costs \$1.18 per fl. oz., while functionally the same ink in a cartridge costs \$118 per fl. oz.\*



*The black printer ink found wholesale on the left costs 100-times as much as the retail black ink cartridge on the right.*

Martin Shkreli became a public pariah when he marked up [Daraprim by 5,000%](#). Meanwhile, printer manufacturers regularly markup ink by some 10,000%. We shouldn't tolerate price gouging on medication, nor should we turn a blind eye to the practice for other products.

How can the ink in a name-brand cartridge cost 100-times as much as the same ink in a bottle? Manufacturers have designed an elaborate markup racket using anti-choice technology to cajole, push, and even force us into paying exorbitant prices for ink.

For example, manufacturers design printers that reject cheaper third-party ink cartridges. These software locks push us to buy their name-brand expensive ink. As a result of these schemes, ink cartridges waste our money and become another unsustainable single-use plastic product.

We shouldn't have to pay so much for ink. I recommend three ways to restore transparency and choice to the marketplace.

## **\$21 billion in ink sales**

You might question if home printers are relevant, but [47% of American households still have one](#) and our country spends more than \$21 billion on ink cartridges per year.\*

I've calculated that Americans could save \$10 billion per year by using refilled ink cartridges.\* Refilling rather than manufacturing single-use plastic cartridges could save the plastic equivalent to 4 million single-use plastic grocery bags per year.\* Unfortunately, we can't choose refilled or third-party cartridges if our printers' software pushes us into buying expensive name-brand ink.

## **Printers are the poster child for software locks**

Software which favors proprietary ink cartridges forces us into a cycle of replacement when there are cheaper and more environmentally-friendly options available.

Printers aren't alone in their use of software to steer product owners to purchase more from the manufacturer. It's increasingly common for manufacturers to restrict how we use products with software locks. iPhones [restrict repair](#), [Teslas won't accept some third-party accessories](#), and [tractors stop farmers](#) from a set of DIY fixes. Printer restrictions are the poster child for the growing conflict between common-sense ideas of ownership and restrictive copyright claims.

We need the government to regulate these unfair business practices. Policy that protects choice could save Americans billions of dollars and lessen the impact of technology on our environment. We should protect our fundamental freedom to own what we've paid for.

I share three recommendations that can fix printers and address this major fault line in the American economy. The marketplace is full of cheaper and less wasteful products that are difficult to access because companies use software to restrict our choices. If we can fix printers, maybe we can fix the disposability treadmill that pushes us to replace working technology. We can have products that are designed to last, fixable, and don't rely on a business model of extorting us for revenue extraction.

## **Why manufacturers restrict ink choice**

Printer manufacturers operate on a "razor-and-blades" business model, meaning they [make their money](#) on sales of disposable cartridges with consumable ink. They sell printers [at a loss](#) to get consumers locked into expensive name-brand ink cartridges.

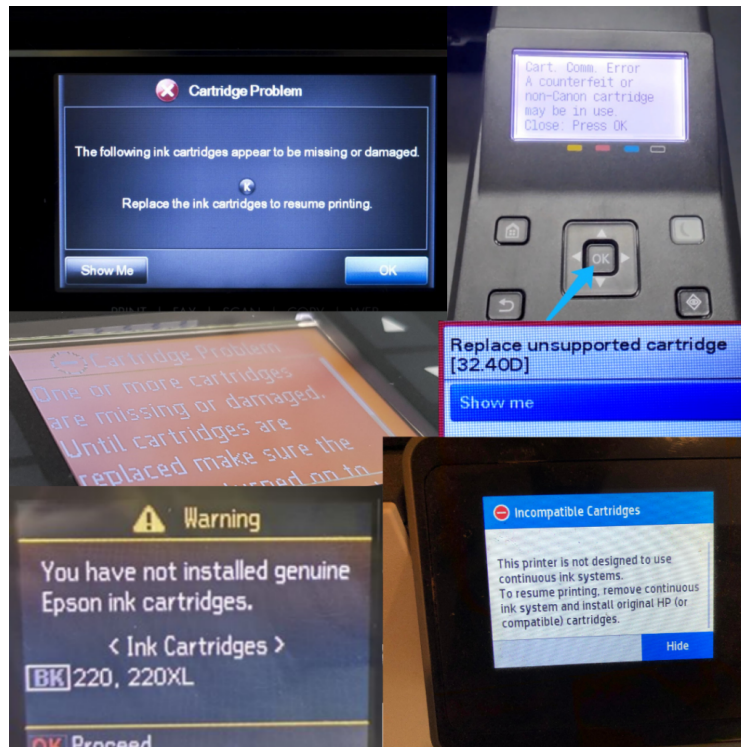
Once we've taken the bait, manufacturers sell their ink for a much higher cost than a competitive market would allow. To keep making money, manufacturers need to stop us from

filling our printers with our own choice of ink. They push, prod, and even force us to buy their expensive ink when there are cheaper and more environmentally-friendly options available.

## How printers keep us dependent on expensive ink

### 1) They program the printer to accept only name-brand cartridges

Manufacturers put computer chips on their cartridges. If the printer doesn't detect that proprietary chip, it then can discourage or block users from using third-party ink.



Manufacturers often claim these restrictions are for “security.” I couldn't find any example of criminals causing damage by using third-party ink cartridges, nor does that seem plausible. If a company is restricting how we use products we've purchased, the burden of evidence should be on the manufacturer to prove the necessity of these restrictions. Especially when, [historically](#), [manufacturer mistakes](#), and not third-party ink, have been the [causes](#) of [security issues](#).

These companies' own actions call into question their security claims. During the pandemic when supply chain disruptions prevented easy access to the computer chips needed to restrict third-party ink cartridges, [Canon sold their own ink without chips](#) and told consumers it was fine to ignore warnings.



## 2) They block features to push us to buy unnecessary ink

Many of our home printers are also scanners and copiers, often marketed as “all-in-one.” We all know that ink is required for printing and making copies, but manufacturers have gotten in hot water for [restricting access to scanning when ink is low](#). Why would ink be needed to scan documents if not only because it helps manufacturers make a quick buck?

[HP](#) and [Epson](#) both had ink subscription services that claim to help us save money and the hassle of remembering to buy more when we’re running low. This is convenient for many consumers until they hit a snag.

*Error.* Printer owners were confronted with an error message because, through no fault of their own, Epson was unable to process their payment for their ink subscription service ReadyPrint. These payment issues resulted in [Epson remotely disabling the printers and ink](#) that users already owned. HP users have similarly been met with [remotely disabled printers when they stopped their Instant Ink subscription](#).



## 3) Premature low ink warnings

[Epson](#) was sued for allegedly indicating that cartridges were low on ink far before, according to plaintiffs, it was necessarily true. Users say they were met with an error that wouldn't allow them to print due to "low ink level" warnings—although they claim there was plenty of ink left to use. A PCWorld investigation found that weighing dead cartridges revealed "[some left more than 40 percent of their ink unused.](#)"

The upshot is that "low ink" doesn't mean the cartridge is out of ink. There could be hundreds of pages left to print, or just two. These vague warnings encourage us to buy more ink that we might not need.

#### 4) Designed to waste

According to testing by Consumer Reports, "[with many printers, more than half of the ink you buy will never wind up on a page.](#)" Many printers are very inefficient and even wasteful with the pricey ink we've bought with our hard-earned cash.

Printers don't just use ink for documents and images, they also clean their printheads with ink. This maintenance is necessary but the inefficiency of ink used isn't. There are [large disparities in the amount of ink used for printhead cleaning](#) among different models and brands. That means companies could invest in efficiency if they chose.

### We need printer ink freedom

We should be able use whichever ink cartridges we choose for our printers. For example, some companies recycle empty cartridges by refilling them with ink. If we choose, we should be able to refill the cartridges in our printer with competitively priced ink rather than be pushed to pay a premium to manufacturers.

Using refilled cartridges is a good deal for our wallet and our planet. **Americans could save \$10 billion per year by using refilled ink cartridges.** We could save the plastic equivalent to 4 million single-use plastic grocery bags per year.\* That's because it takes plastic to produce the body that holds ink in single-use cartridges.

After the materials needed to make these cartridges have been extracted, the carbon needed to produce them has been emitted, and we've used up the ink to print our return labels, the vast majority of [used cartridges end up in landfills](#). These cartridges join the growing electronic waste stream, which in [2021 weighed more than the Great Wall of China](#). Reusing these cartridges and refilling them with new ink can reduce the carbon emissions needed to produce them by between 33% and 61%.\*

#### Why can't I refill my printer ink cartridges?

Major printer manufacturers such as Epson, HP, and Canon have tried to block cartridge refilling using software restrictions and their market power. Consumers once were able to refill cartridges themselves at [Office Max](#), [Walgreens](#), [Costco](#) and other retail stores—now it's increasingly rare to find. Aftermarket cartridge expert Aaron Leon believes these services

became unviable due to the software restrictions and complicated encrypted computer chips manufacturers have installed on cartridges.

HP [reportedly](#) promised heavy incentives to retailers who would stop selling refilled cartridges.. [HP](#) and [Canon](#) have also had Amazon remove hundreds of listings for third-party ink claiming the products violated the companies' intellectual property". As of writing, Staples sells refilled ink cartridges, but consumers can't refill used cartridges.

While ink cartridges seem to have had little innovation in decades, manufacturers *have* developed inventive legal arguments to stop cartridge refilling. Lexmark sued a third-party cartridge chip manufacturer for infringing their copyright and [claimed consumers were bound by an agreement](#) not to resell cartridges because they opened packaging with the terms printed on it. In 2017, [the Supreme Court ruled 7-1 against](#) the printer manufacturer. The court's decision affirmed "patent exhaustion" which, "[prevents patent owners from controlling goods after sale and interfering with your right to resell, tinker with, and understand the things you own.](#)" This ruling was a win for consumers.

### 3 ways to fix printers

Once I've bought it, I own it. We shouldn't need to be a lawyer to understand the basic meaning of buying a product. Once I buy it, it's my choice to cough-up the cash to buy name-brand ink, buy cheaper and more environmentally-friendly refilled cartridges, or try filling my printer with fruit juice.

Our ink choices are still restricted after [HP](#) was fined over 10 million dollars for 'misleading and aggressive commercial practices' that the Italian Antitrust Authority found misled consumers about their ability to use third-party ink cartridges, [Lexmark](#) lost a Supreme Court case, and [Epson](#) and [Canon](#) have both been the targets of class-action lawsuits. We need the government to step in and restore our printer ink freedom once and for all. Here are three recommendations governments could implement to fix printers:

1. **Ink Sunshine:** Ink manufacturers should be required to list the amount of ink in each cartridge. Retailers should include a "price per ounce" similar to supermarkets that include "price per unit" stickers to allow consumers to compare prices apples-to-apples. Both ink cartridges and printers should be required to include the ink efficiency of the device. Assuming standard usage, how many pages should I expect to be able to print per a standard unit of ink? Let the sun shine through the inky murk so we can choose the products that meet our needs.
2. **Protect Retail Choice:** Printer manufacturers shouldn't be able to use their market power to prevent retailers from selling aftermarket inks. Contracts that prevent brick-and-mortar or ecommerce retailers from selling refilled or third-party ink cartridges should be invalidated. Market-dominant companies shouldn't be able to force retailers to curb competition. With equal opportunity to compete, the inks that provide the most value will sell more.



3. **Stop Anti-Competition Software:** The Federal Trade Commission (FTC) should clarify that using software to push us to buy ink only from the manufacturer constitutes illegal “tying.” Companies are not allowed to tie the use of one product to the purchase of additional items or services. The [FTC’s guidelines](#) explain, “the general rule is that tying products raises antitrust questions when it restricts competition without providing benefits to consumers.” Neither consumers nor the planet benefit from the lack of healthy competition among ink manufacturers. Printer firmware and computer chips that prevent the use of third-party ink cartridges only benefit manufacturer bottom lines.

## How to save money on printer ink in 2023

While we fight for our right to own what we’ve bought, I have two recommendations to save money on ink cartridges.

### Buy quality refilled ink cartridges

For many of us printing return labels, tickets, or homework, quality refilled ink cartridges could be an economical and green solution. Many refilled cartridges are of comparable quality to name-brand ink at nearly half the cost.\* We need to be savvy because some bad actors sell subpar products that will cause frustration not worth the savings.

My recommendation is to stick to well-known brands in the refilled ink cartridge industry such as Staple’s [TRU RED](#), [LD](#) and [Clover](#). These are often sold as “remanufactured,” cartridges. It’s a safe bet to buy any third-party ink cartridges sold by major retailers such as Best Buy and Staples. Look for money-back guarantees that the cartridges you purchase will work with your printer (such as those from [LD](#) and [Clover](#)).

In general, avoid so-called “compatible cartridges,” especially sold by retailers with less quality assurance such as Amazon or eBay. “Compatible cartridges” sometimes, although not always, are lower quality than refilled ones. These cartridges also have fewer environmental benefits because similar to a name-brand cartridge, the body is single-use plastic rather than refilled.

### Go to your local library, cafe, or print shop

Consider whether you need to own a printer at all. Like many of my fellow millennials, [I haven’t owned a printer since college](#). (Even fewer college students today may own a printer because of the prevalence of shared [printer stations on campus](#).) My plane tickets are kept on my phone, personal documents are encrypted PDFs, and my work happens in the cloud. The rare times I need to print a return label I use the public self-service printer at my local cafe, and when I need to scan a so-called “wet-signature” I print, sign, and take a picture with my phone. I’m happy to pay a buck (and treat myself to a pastry) on these rare occasions to avoid the hassle and costs of owning a printer.

Your local library likely has affordable printers, scanners, and copiers you can use. Local print shops or chains such as FedEx and Office Depot provide affordable printing services. Often

these can be as simple as emailing your file, paying, and picking up your document. You can also search for a local [ePRINTit](#) or [PrintWithMe](#) self-service public printer like the one at my local cafe.

## **The inky soul of digital freedom**

Cory Doctorow, digital advocate and writer, beseeched that [“the battle for the soul of digital freedom \[is\] taking place inside your printer.”](#) We’re being increasingly told by manufacturers that we must stay inside a walled-garden in which we’re only allowed to use our tech in ways that just-so-happen to generate the most profits for our captors. We’re pushed to replace our phones, laptops, appliances, printers, and cartridges at evermore rapid rates while reuse, repair, and DIY ingenuity is discouraged or restricted. Not only is the rising cost of e-waste unsustainable, products designed to thwart competition and thrift are downright un-American.

Many of these restrictions trace their start to printers. If we can fix printers with transparency, competition, and choice, maybe we can fix it all. We can have technology that’s designed to last, is fixable, and restores our freedom to choose.

## | \* Methodology

To determine the markup for ink cartridges I compared ink cartridge costs per fl. oz. with functionally equivalent wholesale ink costs per fl. oz. I found [wholesale black printer inkjet ink](#) for \$39.90 per liter or \$1.18 per fl. oz. I found [standard cartridges](#) were priced at \$19.97 for an undisclosed amount of ink. The volume of ink per cartridge capacity is a closely guarded secret. [Other investigations](#) have found that standard capacity cartridges likely contain as little as 3.5 ml to 5 ml of ink—assuming 5 ml of ink is equivalent to \$118.12 per fl. oz.

To calculate that Americans could save \$10 billion dollars by using refilled ink cartridges I used the most conservative estimate on savings I could find. [InkGuides.com](#) is a prolific reseller of third-party and refilled ink cartridges and toner. Their estimates for money saved for both toner and cartridges per brand averages 48% cheaper than manufacturer products. I opted to include the estimated toner savings to be conservative and decrease the overall average saved. The [IT Hardware survey](#) by Credit Suisse estimated that North Americans spent \$23.616 billion on printer cartridges in 2015. This is the most recent and specific estimate I could find. With the population in 2015 of the U.S. as 320,738,994 and North America as 356,507,139 according to [The World Bank](#), the equivalent proportion of printer cartridge revenue for the U.S. is approximately \$21,246,621,045. 48% savings of this printer ink cartridge revenue is \$10,198,378,102.

To calculate that refilled printer cartridges could curb carbon emissions by between 33% and 61%, I reviewed several life cycle analyses (LCAs) that calculate the environmental costs of the entire lifecycle of printer cartridges. One study found refilled, known in the industry as remanufactured, cartridges [reduced greenhouse by 61%](#), a remanufacturing [industry LCA](#) found carbon reductions of 53% for black ink and 49% for color ink for an average reduction of 51%, and a [final study](#) found a reduction of 33%.

To calculate that single-use OEM ink cartridges in the U.S. waste plastic equivalent to 4 million single-use plastic grocery bags per year I started by calculating the plastics used by manufacturing new ink cartridges. I assumed 43 g of polypropylene plastic was used for each cartridge body based on a 2004 LCA co-authored by Epson Europe. 93.9% of materials for new OEM printer cartridges are modeled to be either landfilled or incinerated as so-called "[waste-to-energy](#)," according to a 2010 LCA by the Centre for Remanufacturing and Reuse. This study took into account assessments by the UK Market Transformation Program and information provided by HP. Given the figure of 634,336 cartridges consumed in the U.S. per year calculated above,  $43 \text{ g} * 634,336 \text{ cartridges} * 93.9\% \text{ wasted} = 25,612,585 \text{ g}$  of plastic wasted with OEM cartridges per year. I assumed 6.24 g of plastic per single-use plastic grocery bag based on a [2014 LCA](#).  $25,612,585 \text{ g}$  of plastic wasted with OEM cartridges /  $6.24 \text{ g}$  per plastic bag = 4,104,581 plastic-bags-equivalents of plastic wasted by OEM ink per year in the U.S.