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Antimicrobial Ingredients Are Everywhere. But Is That Really a Good Thing?

Microban technologies are found in common cleaning sprays and a host of other household and commercial products. But are they safe, or should you steer clear?

// BY [HEATHER MAYER IRVINE](#) SEP 20, 2021

Recently I was out shopping for doorknobs when I noticed a set that featured Microban® technology. Alarm bells instantly went off in my head. I recognized that name: Months earlier, our cleaning folks had started using a Microban disinfectant spray, and my husband had asked them to

swap it out because some of its ingredients, including quaternium-24, didecyldimonium chloride, and benzalkonium chloride, are linked to negative health outcomes, including hormone disruption and respiratory effects.

I'll note here that Microban 24, the sanitizing spray and cleaner brand, uses Microban technology, which is owned by Procter & Gamble (P&G), the multinational consumer goods behemoth. Meanwhile, W.M. Barr, a cleaning products manufacturer based in Memphis, Tennessee, owns the Microban technology found in items like doorknobs.

So what exactly *is* Microban 24? It's a disinfectant spray that was under development for two years before ultimately launching in February 2020, says Maria Striemer, RN, a senior scientific communications manager with P&G. The product line includes a sanitizing spray, a multi-purpose cleaner, and a bathroom cleaner.

“JUST BECAUSE SOMETHING IS REGISTERED WITH THE EPA DOESN'T MEAN WE KNOW THE LASTING HEALTH OR ENVIRONMENTAL IMPLICATIONS.”

“It's a sanitizing product that protects surfaces for 24 hours against bacteria, even after multiple touches,” says Striemer, who likens the technology to a time-release medication. “It was being worked on well before the pandemic.”

In October 2020, the Environmental Protection Agency approved the product as a sanitizer that *initially* kills SARS-CoV-2, the virus that causes COVID-19. That means if you spray Microban 24 on a surface containing the coronavirus, that virus becomes inactive. However, if you are infected and sneeze on the surface, you must spray *again* to kill that new virus. That's because the 24-hour protection doesn't work against viruses, explains Andy Sullivan, a communications manager with P&G Surface Care.

So if you see the word “Microban” on the label of your favorite household disinfectant spray or in the marketing materials for your next washing machine,

should you buy the product, or steer clear?

WHAT IS MICROBAN 24 USED FOR?

Microban 24 is a sanitizing spray that, according to the brand's website, provides 24-hour protection against *Staphylococcus aureus*—a microbial villain that comes in several varieties, including the methicillin-resistant type known as MRSA, any of which can cause a serious staph infection. The spray is also effective for 24 hours against *Enterobacter aerogenes* bacteria, the site notes. (*Enterobacter aerogenes* is now called *Klebsiella aerogenes*. It's unclear why the new name doesn't appear on Microban 24's website; queries on this from *Popular Mechanics* were not answered.)

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According to the Centers for Disease Control and Prevention, healthy people are very unlikely to contract an infection from *Klebsiella aerogenes*, and these bacteria are primarily found in hospital and health care settings.

Sullivan of P&G Surface Care did not respond to questions about why a household cleaner would include protection against bacterial infections largely occurring in hospital and health care settings.

IS MICROBAN 24 SAFE?



While Microban 24 does not contain triclosan and triclocarban, it does contain Quaternium-24, didecyldimonium chloride, and benzalkonium chloride, which are hormone disruptors.

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There is no shortage of household cleaning products, each with its own laundry list of active and inactive ingredients. And deciphering what's safe and what's cause for concern—Microban 24 included—can be a challenge.

The EPA does provide some government oversight for household products; however, as the experts point out, the technology is often developed faster than the regulators can keep pace with. So just because a product is registered with the EPA doesn't mean we know its lasting health or environmental implications.

Thankfully, a new trend is emerging as companies become more mindful of consumers' health and the environment. Safer ingredients are replacing those that have been linked to negative health and environmental outcomes, says Samara Geller, an analyst with the Environmental Working Group (EWG), a nonprofit focused on public awareness of toxins in cleaners, cosmetics, and other consumer products.

Two ingredients of concern in household cleaning items and personal care products are triclosan and triclocarban.

The people behind Microban 24 will be the first to tell you that its cleaning products do not contain triclosan or triclocarban. These were introduced in the 1960s as pesticides and eventually found their way into personal care items such as soap, shampoo, and toothpaste.

In late 2016, the U.S. Food and Drug Administration issued a ruling that companies could not market antibacterial washes that contained triclosan or triclocarban. According to the agency, manufacturers failed to show that these ingredients were safe for long-term daily use or that they prevented illness any more effectively than plain soap and water. Procter & Gamble, which owns Microban 24, has eliminated triclosan from its products and is in the process of eliminating its use of triclocarban.

An EPA spokesperson told *Popular Mechanics* via email that while there are some products registered by Microban that contain the active ingredient triclosan, there are no EPA-registered products containing triclocarban.

Triclosan and triclocarban have been identified as endocrine-disrupting chemicals, says Andrea Gore, a professor of pharmacology at the University of Texas at Austin. Research suggests that these chemicals, commonly called EDCs, can interfere with the human body's hormonal systems.

While Gore doesn't specifically study triclosan and triclocarban, she explains that EDCs can interfere with any process that's affected by natural hormones.

"EDCs can sometimes block natural hormones or mimic them," Gore says. "For

example, in a stage of development that wouldn't normally have high levels of hormone, you might be exposed to an EDC, and your body is tricked into thinking it's being exposed to that hormone. Then your body responds as if it's responding to a hormone even if it's not supposed to be at that stage of development.”

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Is My Household Cleaner Safe?

The ingredient list on the label of your favorite household cleaning product can be downright confusing. To evaluate whether or not that disinfectant spray contains harmful ingredients such as triclosan, triclocarban, quaternium-24, didecyldimonium chloride, or benzalkonium chloride, turn to the Environmental Working Group's digital guide.

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- **Step 1:** Head to www.ewg.org/guides/cleaners/.
- **Step 2:** Enter the name of the product in the search bar at the top of the page (shown above).
- **Step 3:** Check out the results page, which will list each associated product, along with a letter grade for the product's safety rating, which ranges from “EWG Verified” (the best score) to F (highest concern).

The EWG says it provides information on cleaning product ingredients “from the published scientific literature, to supplement incomplete data available from companies and the government.”

Gore points out that exposure to triclosan has also been associated with higher body weight, according to findings from the [National Health and Nutrition Examination Survey \(NHANES\)](#).

“We’re seeing a market shift away from including triclosan in cleaning products like hand soaps and dishwashing liquid,” the EWG’s Geller says. “But it’s still potentially in janitorial supplies, like mops, buckets, sponges, and brooms. It can be in the home, too—in shower curtains and garbage bags, where it’s [still approved for use](#).”

While Microban 24 does not contain triclosan and triclocarban, it *does* contain quaternium-24, didecyldimonium chloride, and benzalkonium chloride, which are considered hormone disruptors.

“Quaternium-24 is in a category of active ingredients [[quaternary ammonium](#)] that we tell people to avoid,” Geller says. “It has environmental concerns, allergy and asthma concerns. The list goes on.”

Geller points out that there’s currently a glut of products containing quaternium-24 on the market, and that manufacturers are pumping out new disinfectants faster than scientists can conduct safety studies and design protocols for regulation. Research has linked quaternium-24 to hormone disruption and [reproductive toxicity](#), which includes adverse effects on [sexual function and fertility](#) in adults.

When asked whether P&G would replace EDCs in its Microban 24 cleaners, Sullivan wrote, “All the ingredients, including the quats [quaternary ammonium], used in the Microban 24 Hour product, have been thoroughly evaluated by internal and external health and safety experts, so you can confidently use it in your home as directed.”

He did not respond specifically to whether P&G would remove quaternium-24 or other identified EDCs from Microban 24.

So what's a consumer to do? Geller recommends reading labels and choosing cleaners or sanitizers that have safer ingredients, including citric acid and hydrogen peroxide, which serve as disinfectants. [This guide](#), from the EWG, is a helpful, comprehensive tool in evaluating product safety.

IS MICROBAN 24 THE SAME AS EMBEDDED MICROBAN TECHNOLOGY?

In a word: No. But that's what sent me down a rabbit hole of research and interviewing, after searching high and low for a doorknob that did not contain Microban (and was also matte black with a flat knob, for what it's worth).

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Microban includes various antimicrobial technologies with such brand names as SilverShield, ZPtech, Aegis, and Excalibur, which are mixed into [partner products](#), including [doorknobs](#), [washing machines](#), [suitcases](#), footwear, high chairs, and health care products—to name just a few. According to Microban's website, its technologies are in more than 1,000 products across more than 300 brands.

These antimicrobial additives are designed to kill, well, microbes. They do this

by blocking bacteria from growing and reproducing, according to the door hardware company Kwikset.

And while microbes *are* everywhere, they're not always the disease-causing "bad" bacteria. In fact, there is a plethora of good bacteria that can improve health, like probiotics, which support a healthy gut. When we broadly kill all microbes, we're also killing the good guys.

“A DOORKNOB WITHOUT TREATMENT IN A PUBLIC RESTROOM, FOR EXAMPLE, MAY START TO SMELL LIKE URINE IF PEOPLE AREN'T WASHING THEIR HANDS AND THEN TOUCHING THE KNOBS.”

On the flip side, Microban declares that antimicrobial additives do not cause superbugs—drug-resistant bacteria. But a microbiologist I spoke with says *most* things don't cause superbugs, and just because a technology checks off that box doesn't mean there aren't other concerns.

Because Microban additives are registered with the EPA as pesticides, the company can't make health benefit claims, which explains this disclaimer on its website: “Microban technologies are not designed to protect users or others from disease-causing microorganisms and are not a substitute for normal cleaning practices.”

And a disclaimer on the Kwikset website regarding its Microban technology says, “Microban is not effective against disease-causing bacteria.”

In other words, using a product with Microban technology, or another company's antimicrobial additive, isn't going to make *you* healthier or less likely to get sick.

“What the EPA has allowed in terms of claims [for embedded antimicrobial technology] is that it inhibits the growth of non-health-related microorganisms,” says Geller. “It inhibits the growth of bacteria or fungus in the product itself as it relates to the deterioration of the product. It's not for the public health concern

of germs or protecting human health.”

Erik Glassen, a senior brand manager with Kwikset, told *Popular Mechanics* that the Microban technology offers “an added benefit of continuous antimicrobial protection to help prevent stains and odors on the product surface.” He also noted that the doorknobs would not fall apart without the added antimicrobials.

The Microban technical team agrees: Certainly most hardware wouldn’t fall apart without antimicrobial additives, but a doorknob without treatment in a public restroom, for example, may start to smell like urine if people aren’t washing their hands and then touching the knobs.

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There may be a sustainability benefit in the case of athletic wear treated with antimicrobial additives, according to the Microban technical team. For example, polyester fabric—the main material used in activewear—is a magnet for odor-causing bacteria.

“People resort to environmentally damaging means to rid the smell by overuse of detergent, which is useless and discharges more chemicals into the sewer, repeated washings, which are useless and discharges microfibers into the wastewater that are eventually deposited into the ocean, or throwing the item away and purchasing a new one, which is unsustainable,” according to Microban.

But we’re not totally sure how the environmental benefits are measured.

It’s also unclear how the effectiveness of the Microban technologies are tested. The company highlights its extensive testing facilities, which are approved for running antimicrobial tests, but it says it cannot disclose its findings because they would be seen as a health-benefit claim.

A Microban brand director explained that the EPA vets its products through safety issues, including toxicology, carcinogenicity, skin contact, and respiratory hazards.

SHOULD I USE PRODUCTS THAT CONTAIN MICROBAN TECHNOLOGY?

On its face, buying a product that has protection “against bacteria and microbes” seems like a good thing, especially when much of the world has become germophobic as we make our way through the [COVID-19 pandemic](#).

But there is a lot we don’t know when it comes to what’s inside antimicrobial additives, and experts say that uncertainty is risky. And with regard to COVID-19 and other viruses, these additives are not antiviral.

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“If a product only gives you an active ingredient, to me, that’s a problem,” says Gore. “Knowing what’s in a product is important. There’s no downside to transparency and then letting people decide whether they want to put it in [or on] their body.”

According to an EPA registration for Microban’s SilverShield antimicrobial, for example, the additive contains 97 percent zinc oxide and three percent “other ingredients.” Those other ingredients are not listed anywhere.

“We’re not finding any information that indicates [antimicrobial additives] are an effective use in embedded technology,” Geller says. “We don’t know the efficacy in terms of public health outcomes. [The additives] are still generating exposure, not necessarily directly, but we don’t want these in the environment at all...Limited use could provide health benefits in special cases, but we’re talking about indiscriminate use.”

I was left with a lot of unanswered or vaguely answered questions from companies about whether embedded antimicrobials are safe and effective. The default response: “Our products are registered with the EPA and our products meet EPA requirements.”

I know the technology can protect my products from mold and mildew, but are those benefits worth potential downsides that could impact my health? It’s hard to say when companies don’t provide the full story.

After much searching and cursing, I did finally find the black matte doorknobs of my dreams, free from antimicrobial technologies and [California Prop-65](#) warnings. They’re from Schlage.

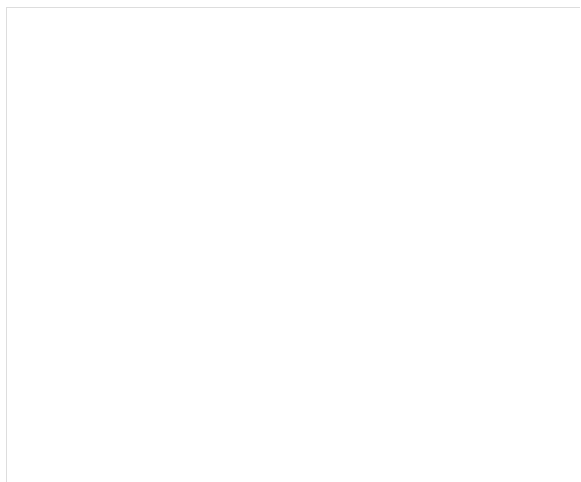
Heather is the former food and nutrition editor for Runner's World and the author of [The Runner's World Vegetarian Cookbook](#).

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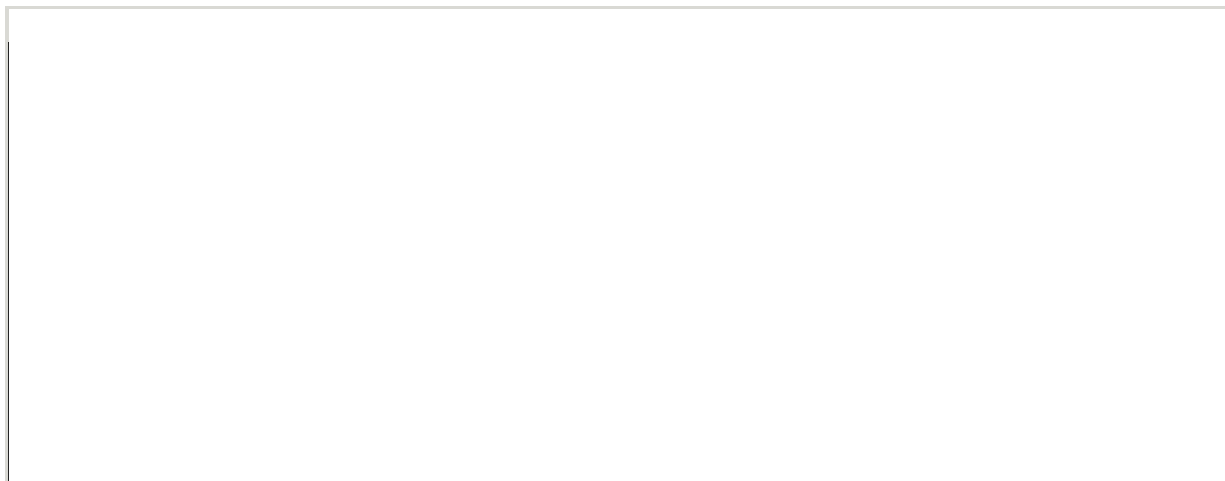
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