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## Are your period pants safe?

Which? tests reveal high levels of silver in period pants from popular brands

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Period pants are absorbent pants which have become popular in recent years. They are marketed as an eco-friendly alternative to disposable sanitary products – of which 200,000 tonnes goes to landfill in the UK each year.

But some use silver-based textile treatments which aren't always obvious from the packaging, and that we have concerns about.

Our testing revealed notable levels of silver in pants from Bodyform, Marks & Spencer, Thinx and Luna.

These findings are potentially concerning, as experts we spoke to suggest silver is at best an unnecessary extra, and at worst may have as yet unknown health implications.

What's more, silver used in textiles can impact the environment if it leaches out when you wash your pants and gets into waterways, which is alarming considering the eco credentials espoused by many brands.

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### Period pant chemical concerns

Earlier this year, popular brand Thinx settled a class-action lawsuit in the US after independent testing alleged the presence of both per- and poly- fluoroalkyl substances (PFAs - also known as forever chemicals) and nano silver in its period pants. popular or standard style from each brand (bikini / classic).

Our independent lab conducted chemical analysis to check for a list of common 'chemicals of concern', including silver.

We also checked for:

- Forever chemicals (PFCAs, PFOs and PFOAs)
- Chromium VI
- Cadmium
- Lead
- Arsenic

None of the pants that we tested contained any PFAs banned by REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals). We can't categorically say, however, that no PFAs are present in these pants, as PFAs are a very large class of chemicals and not all of them are regulated. More research is needed to establish what other PFAs exist.

We didn't detect any Chromium VI, Cadmium or Arsenic.

The pants we tested from Lovable and Sloggi contained very low levels of lead, but below legal limits and not in amounts to cause concern.


### Should I stick to disposable period products?


- Airism (Uniqlo) - 0.3mg/kg
- Cool Period - 0.2mg/kg


The test was able to detect silver if it was present at above 0.1mg per kg.

No silver was detected in Primark, Repeat, Wuka, Lovable and Sloggi pants in our tests, though


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Sloggi's website states it does use a silver-based antimicrobial, known as Silvadur, which uses 'bound silver ions', and Primark says it uses an antimicrobial treatment but doesn't specify what it is (though it later confirmed to us this contains silver chloride - see full response below).

There is currently no legal limit on the amount of silver allowed in textiles and textile standard Oekotex doesn't currently contain any requirements around silver content.

Head to our [period pants guide](#) to see which ones users rated best for style and absorbency

## Why is silver in period pants?



Silver works as an antimicrobial agent. It's typically added to products to combat the spread of microorganisms which can be harmful or lead to odours.

While it has long been used in, for example, some wound coverings (though not without controversy, as this [2019 US study shows](#)), it has increasingly been showing up as a 'functional extra' in clothing and elsewhere.

In the case of period pants, brands say it's added to combat user concerns about the pants smelling.

But the truth is, you don't need silver - or any antimicrobial agent - in your period pants either for odour or safety. It may not even do the job intended effectively, and some scientists have raised concerns about the potential health impacts of using silver-based anti-microbial treatments in such products.

## Do I need silver in my period pants?

No. It's not essential for combating odour, and there's no evidence that menstrual blood contains harmful bacteria requiring antimicrobial treatment. Implying it does, even if it's responding to user concerns around odours, plays into long-standing taboos around menstruation.

It goes without saying that normal, moderate hygiene routines should be followed and that period pants should be washed and changed according to manufacturer instructions to keep them hygienic.

But anything beyond this isn't necessary.

Testing has shown that items treated with silver often don't actually have the promised antimicrobial properties, especially when it comes to treated textiles.

When AltroConsumo tested 20 products that contained silver for antibacterial purposes in 2013, they found only one third of these products were effective at being antimicrobial. Many of the samples lost their silver content after just two washes.

## Is silver in period pants safe?

You might find several different types of silver treatment in your pants, all of which are distinct from inert silver of the kind used in jewellery. These include nanosilver (microscopic particles of silver), silver zeolite, silver copper zeolite or silver zinc zeolite, or silver chloride.

Our tests weren't able to determine which type of silver was present, but we have concerns regardless of the type.

There is currently limited research into the impact of these types of silver on human health, but experts have raised concerns about particles potentially migrating into the body, and disrupting our skin microbiome by killing beneficial bacteria.

Little scientific data exists on the impact of nanosilver on the human body. Existing research to date has either focused on other areas of the body or on animals. However, skin surface fluids and skin barrier integrity are known to have an important impact on exposure potential from textiles. This is of concern because vulvar and vaginal tissue are known to have unique properties and to be especially absorbent.

A [2015 study on rabbits](#) by the National Institutes for Food and Drug Control, Beijing, concluded that nanosilver caused structural changes to vaginal mucosa, urethra and rectum, which accumulated in the rabbit's blood circulation.

The FDA (US Food and Drug Administration) found that [nanosilver can kill lactobacillus](#), the healthy bacteria in your vagina which help fight off infection, which could put you more at risk from harmful bacteria, potentially leading to increased risk of bacterial vaginosis, STIs and pregnancy complications.

The [ECHA \(European Chemicals Agency\)](#) states that [silver zinc zeolite is suspected of having reproductive toxicity](#), but more research is needed.

We spoke to Thiago Verano-Braga, Associate Professor at the Universidade Federal de Minas Gerais in Brazil, who has studied silver nanoparticles for a number of years. He told us: 'Manufacturers absolutely shouldn't be using silver nanoparticles in pants before a critical

assessment of potential risks and that while the anti-microbial properties of silver nanoparticles have led to them becoming one of the most widely used nanomaterials in consumer products, there is a high chance of these nano particles being absorbed into the human body. Furthermore, it is important to test whether silver ions are being generated since they are extremely toxic and may be released from silver nanoparticles in acidic conditions. Typical vaginal pH is more acidic than neutral.'

## What's the law on chemicals in period pants?

There are currently no legal limits in the UK about how much silver can be added to period pants, or indeed textiles in general.

Legislation is often slow to catch up to new tech. For example, period pants were only recently exempted from the 'tampon tax', ie. VAT on sanitary products, whereas this was removed from conventional period products in 2021.

However the use of silver zeolite as an antimicrobial more broadly in textiles is currently under review in the EU.

In March 2023, the EU banned silver copper zeolite as an active substance in 'products used in food and feed areas' (such as food packaging and other products that come into contact with food) on the basis that its efficacy hadn't been demonstrated for its intended use.

It said that: 'Extensive testing and research have revealed concerns regarding the potential risks associated with the consumption of food that has come into contact with treated polymers containing silver copper zeolite'.

If silver zeolite isn't safe for products that come into contact with food, because of the risk of the silver travelling into the food and then into your body, we don't think it should be in your underwear either.

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[Anti-microbial face masks: do they offer any more protection against covid?](#) We investigate the rise in 'virus-killing' coatings post-covid

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## Why your 'eco' period pants might be harming the planet



Pants containing silver-based treatments could harm the environment too. Ironical, considering many people choose them in an effort to be more eco-friendly (and plenty of brands market them along these lines).

The [ECHA](#) states that silver in ion form (such as zeolite) or nano form is very toxic to aquatic life with long-lasting effects, though this does depend on the concentration.

There is a risk of silver migrating from textiles into our waterways when washed, especially silver in nano-particle format.

Whether or not the silver itself is washed off from the pants, repeated washing of your pants will lead to small particles of fabric being released into the environment, which could contain silver. While it may not be an issue in small amounts, increased use of these treatments could therefore have an impact.

## Should I buy period pants containing silver?

Right now, we don't think so. The problem is, it's not always easy to tell if they do.

Manufacturers aren't obliged to declare the presence of silver on their packaging or website, though look out for mentions of silver-based, anti-odour, antibacterial or anti-microbial technology, which could mean silver or other biocides have been used.

We think it should be clear what you're buying at the point of sale, so you can make an informed choice.

## Our chemical analysis of period pants

We bought the nearest equivalent to medium flow, medium sized black pants, in the most popular or standard style from each brand (bikini / classic).

Our independent lab conducted chemical analysis to check for a list of common 'chemicals of concern', including silver.

We also checked for:

- Forever chemicals (PFCAs, PFOs and PFOAs)

- Chromium VI
- Cadmium
- Lead
- Arsenic

None of the pants that we tested contained any PFAs banned by REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals). We can't categorically say, however, that no PFAs are present in these pants, as PFAs are a very large class of chemicals and not all of them are regulated. More research is needed to establish what other PFAs exist.

We didn't detect any Chromium VI, Cadmium or Arsenic.

The pants we tested from Lovable and Sloggi contained very low levels of lead, but below legal limits and not in amounts to cause concern.

## Should I stick to disposable period products instead?

Disposable period products, be they sanitary towels or tampons, often contain plastic and have a huge environmental impact. [City to Sea](#), the charity behind the Plastic-Free Periods campaign, says that 3 billion disposable menstrual products are used every year in the UK and 200,000 tonnes of menstrual waste is landfilled in the UK every year.

Reusable and plastic-free options are a step in the right direction, but we want to ensure new products are clear with consumers on what they contain and avoid unnecessary extras - especially those with potential safety concerns.

There are reusable options which don't contain biocides. Some brands clearly state so on their websites, such as WUKA, which says of its period pants: 'We refuse to add any silver treatments or antibacterial treatments to our products and we regularly test for additional chemicals including PFAs.' It does however use a silver chloride treatment for its incontinence pants.

Thinx and Modibodi both told us they will be launching new ranges in 2024 without silver treatments, and Bodyform says it has silver-free options available too (though we couldn't see a way to distinguish this on the website).

You can also try other options such as menstrual cups. Find out more in our [guide to eco period products, including menstrual cups, reusable applicators and reusable period pads](#).

## What the manufacturers say



We put our findings to the period pant manufacturers. This is what they told us:

### Intima by Bodyform

The pants we tested say that they contain 'an antimicrobial substance' and 'silver copper zeolite' on the packaging, but the latter is in very small writing, and not in the ingredients section. The website states that they are 'guaranteed safe from chemicals and toxins'.

It also says 'Our antimicrobial treatment (our special odour control solution) contains zeolites, silver and copper ions which have antibacterial properties which means they're really good at helping to reduce any odours that are caused by bacteria, as well as limiting the growth of bacteria in the first place.'

*Essity, who owns Bodyform, told us: 'Consumers can wear Bodyform period underwear with confidence because they are safe, sustainable and provide superior performance. The pants tested contain silver copper zeolite to prevent odour when wearing the pants for up to 12-hours, which our research shows is a key concern for customers. To be clear, period blood does not require anti-bacterial treatment, but odor-causing bacteria can grow on some bodily fluids that have been discharged from the body after a number of hours.'*

*Our collection also includes ranges that are without an antibacterial property for those who prefer an alternative. All of our washable underwear is certified according to Oeko-Tex standard 100 which means that every single component has been tested for harmful substances and that the underwear has been designated as harmless for human health.'*

### M&S

There is no mention of antibacterial treatments or silver on the M&S website or on the label of the pants that we tested.

M&S did not respond to our request for comment.

### Modibodi

The Modibodi website says: 'the mid layer of our undergarment is treated with Agion, an EU-regulated biocide containing silver copper zeolite and silver zeolite. Agion is not a nano particle'.

There was no mention of silver, biocides or antimicrobial/antibacterial treatment on the packaging of the Modibodi pants we tested.

**Modibodi, which is also owned by Essity, told us:** *'Modibodi is committed to pursuing the highest possible safety standards for every element of our products, so our customers can feel confident by choosing Modibodi underwear.'*

*We include a leaflet in every customer order we despatch in the UK and Europe. The leaflet includes information that the middle layer fabric inside the gusset is treated with an EU regulated biocide containing silver copper zeolite and silver zeolite to prevent odour.*

*Modibodi will also launch the entire Modibodi period underwear range without antimicrobial properties from 2024 onwards for those customers who prefer an alternative.*

*All of our products are certified according to OekoTex standard 100 which means that every single component has been tested for harmful substances and that the underwear has been designated as harmless for human health.'*

*Primark*

Primark's website says: 'Our period underwear also uses an antimicrobial treatment to help prevent bacteria, neutralise odours, and maintain hygienic freshness'.

**Primark told us:** *'The antimicrobial finish used on our period pants is Micro-Fresh® which kills the bacteria that causes odours and is tested to be effective for 50 washes. Micro-Fresh® contains natural active ingredients including silver chloride which is approved for use on garments under the Biocidal Products Regulation in the EU and UK and the EPA in the US.'*

*"The nature of period pants means there is a potential for odour to develop during wear (in the same way that bacteria can cause socks and shoes to develop odours during wear) and our antimicrobial finish minimises such odours, giving customers the confidence to wear the product for the intended duration.'*

## Sloggi

Sloggi's website says that it uses: "SILVADUR™ 930 Antimicrobial treatment prevents odours".

Sloggi did not respond to our request for comment.

## Superdrug (Luna)

There's currently nothing on the Luna (Superdrug) packaging to suggest silver, or any other biocide, is used. The Superdrug website says the pants have 'an anti-bacterial and anti-odour gusset'.

**Superdrug told us:** *'Superdrug Luna period pants uses Micro-Fresh technology, a commercially proven anti-microbial fabric treatment that ensures the product has anti-odour benefits, which we believe is a customer benefit with intimate apparel.'*

*We have not seen any evidence to suggest that silver is unsafe to use in these product areas and it has been used for many years.*

*Superdrug's policy is to avoid any harmful or hazardous materials in our products and we hold certification to demonstrate non-migration of the material. Silver is a non-harmful environmental metal and will not cause damage to the environment via waterways.'*

## Thinx

The Thinx website and packaging says its pants contain Agion®, an 'EU regulated odour control treatment using silver zeolite and silver copper zeolite, to protect from odour'.

**Thinx told us:**

*"The odour controlling layers in Thinx products are treated with Agion®, an EU regulated treatment containing silver zeolite and silver copper zeolite. Agion® is widely used for odour resistance in textiles and deemed safe for consumers by the EU.*

*In 2024, we will be debuting underwear with a different treatment that helps minimize and control odour (which doesn't contain Agion).*

*Our underwear is certified based on the rigorous chemical safety requirements of the STANDARD 100 by OEKO-TEX® [20.HUS.04850 | HOHENSTEIN HTTI] and complies with the even more stringent OEKO-TEX® 100 Class II, Annexure IV. As part of this accreditation, we must pass a series of tests, showing no detection of PFAS or harmful chemicals.*

*We require suppliers of our raw materials to sign a Supplier Code of Conduct and Chemical Supplier Agreement confirming compliance with the AFIRM RSL. We also test our finished products through an accredited, globally recognized third-party laboratory to help ensure they are compliant with U.S. and international regulations."*

## Uniqlo

The Uniqlo website says: This product contains the biocide silver zinc zeolite to prevent the growth of odour-causing microorganisms.'

Uniqlo did not respond to our request for comment.

## Cool Period

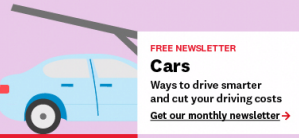
Cool Period's website says its pants are made 'without silver particles'.




We were unable to contact XUETAO, the brand which makes Cool Period pants, but would welcome a conversation with them if they reach out to us in light of our findings.

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