

# A to Z Chemicals of Concern

In this guide, you can learn more about some chemicals of concern that can be found in everyday products and the environment. These chemicals can interfere with the endocrine (or hormone) system or may be linked to breast cancer. Chemicals that interfere with hormones are called Endocrine Disrupting Chemicals (EDCs), and they may affect both male hormones (androgens) and female hormones (oestrogens). High oestrogen levels can increase breast cancer risk; therefore, EDCs that mimic the action of oestrogen may be linked to breast cancer.

Many of the harmful chemicals in this guide can be found on the [labels](#) of [cosmetics](#), [cleaning products](#) and processed [food](#)—so you can use our handy A to Z lists to check ingredients when shopping. However, other products, such as [plastic](#) items, [furniture and clothes](#) are not required to disclose the presence of chemicals; therefore, these chemicals [do not appear on product labels](#).

If you want to learn more about each chemical, check out our [chemical dictionary](#) section, which includes some common pesticides and environmental contaminants.

## On labels

### By group:

#### Aluminium salts:

- aluminium chloride
- aluminium chlorohydrate
- aluminum sesquichlorohydrate
- aluminum zirconium tetrachlorohydrate

#### Fragrances:

- acetyl hexamethyl tetralin (AHTN)
- benzyl salicylate
- fragrance
- hexamethylindanopyran
- parfum
- perfume

#### UV filters:

- benzophenone-3
- benzophenone-4
- ethylhexyl dimethyl PABA
- ethylhexyl methoxycinnamate
- homosalate
- 4-methylbenzylidene camphor
- octocrylene

#### Preservatives :

- BHA
- BHT
- formaldehyde releasers:
  - benzylhemiformal
  - 2-bromo-2-nitropropane-1,3-diol
  - 5-bromo-5-nitro-1,3-dioxane
  - diazolidinyl urea
  - DMDM hydantoin
  - glyoxal
  - imidazolidinyl urea
  - methenamine
  - sodium hydroxymethylglycinate
- parabens:
  - butylparaben
  - ethylparaben
  - methylparaben
  - propylparaben
- triclocarban
- triclosan

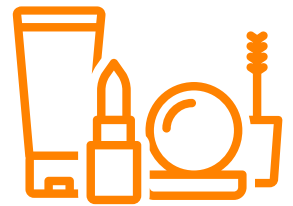
#### Others:

- cyclohexasiloxane
- cyclopentasiloxane
- cyclotetrasiloxane
- lavender oil
- PTFE
- tea tree oil

# A to Z Chemicals of Concern

## On labels

### Cosmetics:



#### A-Z

- acetyl hexamethyl tetralin (AHTN)
- aluminium chloride
- aluminium chlorohydrate
- aluminum sesquichlorohydrate
- aluminum zirconium tetrachlorohydrate
- benzophenone-3
- benzophenone-4
- benzyl salicylate
- benzylhemiformal
- BHA
- BHT
- 2-bromo-2-nitropropane-1,3-diol
- 5-bromo-5-nitro-1,3-dioxane
- butylparaben
- cyclohexasiloxane
- cyclopentasiloxane
- cyclotetrasiloxane
- diazolidinyl urea
- DMDM hydantoin
- ethylhexyl dimethyl PABA
- ethylhexyl methoxycinnamate
- ethylhexyl salicylate
- ethylparaben
- fragrance
- glyoxal
- hexamethylindanopyran
- homosalate
- imidazolidinyl urea
- lavender oil
- methenamine
- 4-methylbenzylidene camphor
- methylparaben
- octocrylene
- parfum
- perfume
- propylparaben
- PTFE
- sodium hydroxymethylglycinate
- tea tree oil
- triclocarban
- triclosan

### Cleaning products:



#### A-Z

- acetyl hexamethyl tetralin (AHTN)
- benzophenone-3
- benzophenone-4
- benzyl salicylate
- benzylhemiformal
- BHA
- BHT
- 2-bromo-2-nitropropane-1,3-diol
- 5-bromo-5-nitro-1,3-dioxane
- butylparaben
- diazolidinyl urea
- DMDM hydantoin
- ethylhexyl dimethyl PABA
- ethylhexyl methoxycinnamate
- ethylparaben
- fragrance
- glyoxal
- hexamethylindanopyran
- homosalate
- imidazolidinyl urea
- lavender oil
- methenamine
- 4-methylbenzylidene camphor
- methylparaben
- octocrylene
- parfum
- perfume
- propylparaben
- sodium hydroxymethylglycinate
- tea tree oil
- triclocarban
- triclosan

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## On labels

### Food additives:

#### A-Z

- E214
- E215
- E218
- E219
- E320
- E321
- imazalil



## Not on labels

### Furniture and clothes:

- flame retardants
- formaldehyde
- PFAS
- UV filters



### Plastic:

- bisphenols
- flame retardants
- heavy metals
- PFAS
- phthalates
- triclocarban
- UV filters

#### Recycling codes to avoid:

- recycling code 7 (bisphenols)
- recycling code 1 and 3 (phthalates)



# A to Z Chemicals of Concern

## Chemical dictionary

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**2,4-dichlorophenoxyacetic acid (2,4-D)** is an herbicide used to control weeds, often in aquatic environments. 2,4-D may have endocrine-disrupting effects at high doses. It is classified as a possible human carcinogen (IARC category 2B); however, studies on breast cancer are limited and inconclusive.

**4-methylbenzylidene camphor (or enzacamene)** is a chemical UV filter used in sunscreen or in other products to prolong shelf life. It interferes with oestrogen and thyroid hormones. It was officially recognised as an EDC by the EU in 2022 and by the UK in 2025.

**Acrylamide** is a probable human carcinogen formed when smoking tobacco or when food is cooked at high temperatures, especially if fried, baked or grilled. Acrylamide may alter oestrogen levels in women, and some studies have shown that dietary intake of acrylamide may increase breast cancer risk in pre-menopausal women.

**Aluminium salts (aluminium chloride, aluminium chlorohydrate, aluminium sesquichlorohydrate and aluminium zirconium tetrachlorohydrate)** are used in antiperspirants to block sweating. Aluminium is a metalloestrogen that may interfere with oestrogen. Whilst most studies have not linked the use of antiperspirants with breast cancer, repeated use of these products throughout the day, starting from a young age, may have an effect on breast cancer risk but more research

is needed in this area.

**Benzophenones** are chemical UV filters used in sunscreen. They may also be found in washing and cleaning products, or in plastic products and textiles to prevent ageing.

**Benzophenone-3** (or oxybenzone) is an EDC that is toxic to the environment and has been phased out or even banned in certain countries.

**Benzophenone-4** may be added to beauty products and toiletries to prolong shelf life. Benzophenones have oestrogenic properties in cells.

**Benzyl salicylate** is a suspected EDC with weak oestrogenic activity. It is mainly used as a fragrance ingredient in cosmetics, toiletries and cleaning products. It can also be used as a flavouring ingredient in food.

**BHA (or butylated hydroxyanisole)** is a preservative and fragrance ingredient used in cosmetics and toiletries. It may also be used as a food additive (**E320**). BHA is an EDC that may interfere with hormone synthesis and the action of oestrogen and testosterone. It is also classified as a possible carcinogen (IARC category 2B).

**BHT (or butylated hydroxytoluene)** is a preservative and fragrance ingredient used in cosmetics, toiletries, washing and cleaning products. It may also be used as a food additive (**E321**). BHT has been shown to cause breast cancer cell proliferation, and is under

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assessment as an EDC in the EU.

**Bisphenols** are additives in products made of polycarbonate plastics (recycling code 7). They may also be found in internal linings of tins and cans, in some till receipts and in menstrual products. Several bisphenols, including **bisphenol A (BPA)** and **bisphenol S (BPS)**, are officially recognised as EDCs by the EU. BPA has oestrogenic properties and has been linked to mammary tumours in animals. While BPA is being phased out from some products, BPA-free products may contain other bisphenols (e.g., BPS, BPF) which may have similar harmful effects to BPA.

**Cyclosiloxanes** include **cyclohexasiloxane (D6)**, **cyclopentasiloxane (D5)** and **cyclotetrasiloxane (D4)**. They are used as solvent carriers, conditioning and spreading agents in beauty products and toiletries. They are persistent, bioaccumulative and may interfere with hormones and be toxic for reproduction. In 2015, the UK proposed banning D4 and D5 from wash-off cosmetics. In 2020, the EU restricted the use of D4, D5 and D6 in all products at levels over 0.1%.

**Deltamethrin** is a commonly used insecticide used in agriculture and to protect pets. Deltamethrin has been shown to have oestrogenic and antiandrogenic activity in cells, and cause reproductive problems in animals.

**Dioxins** are harmful chemicals unintentionally released into the environment during the burning of waste or manufacturing of metal,

paper or chemicals. Some dioxins, such as TCDD, are human carcinogens. Occupational exposure to dioxins or living near certain manufacturing sites may increase breast cancer risk. For the rest of the population exposure to dioxins does not appear to be linked to breast cancer.

**Ethylhexyl dimethyl PABA (or Padimate O)** is a chemical UV filter used in sunscreen other beauty products. It may mimic the hormone oestrogen and affect androgens. It is also considered an environmental pollutant.

**Ethylhexyl methoxycinnamate (or octinoxate)** is a chemical UV filter used in sunscreen, and in other products to prolong shelf life. It is an EDC that interferes with oestrogen, androgen and thyroid hormones and may be linked with reproductive toxicity in animals. Several states (e.g., Hawaii) have banned it due to its environmental toxicity.

**Essential oils** are complex mixtures of hundreds of different chemicals, typically extracted from plant materials. They can be found in soaps, lotions, shampoos, hair products, perfume and detergents. Some essential oils have been shown to interfere with oestrogen and androgens. **Lavender oil** and **tea tree oil** have been associated with abnormal breast growth and early breast development, which is a breast cancer risk factor. Frequent use of lavender oil and tea tree oil may also affect oestrogen levels in the body, so people with oestrogen receptor-positive breast cancer should exercise caution.

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**Flame retardants** are chemicals used to prevent or slow down fire. They are used in electronics, vehicles and furniture. Exposure to brominated (bromine-containing) flame retardants has been linked to an increased risk of breast cancer, and an organophosphorus organic flame retardant called TPhP is officially recognised as an EDC.

**Forever chemicals** - see **PFAS**.

**Formaldehyde releasers** are preservatives that may be used in small quantities in cosmetics, toiletries and cleaning products to stop the growth of microorganisms. Examples of formaldehyde releasers include the following ingredients **benzylhemiformal, 2-bromo-2-nitropropane-1,3-diol, 5-bromo-5-nitro-1,3-dioxane, diazolidinyl urea, DMDM hydantoin, glyoxal, imidazolidinyl urea, methenamine, and sodium hydroxymethylglycinate**. These chemicals may release small amounts of formaldehyde when the product is stored or used. Formaldehyde is a human carcinogen (IARC category 1).

**Fragrance** is a mixture of different chemicals used to give a scent to cosmetics, toiletries and cleaning products. It may include harmful chemicals such as phthalates and synthetic musks. In the ingredient label, the individual chemicals are usually not listed and the generic terms of **fragrance, parfum** or **perfume** may be used.

**Glyphosate** is an herbicide used to control weeds. It is weakly oestrogenic in cells and

alters the development of the mammary gland in animals. It is also classified as probably carcinogenic to humans (IARC category 2A).

**Hair dyes** are cosmetic products used to change the colour of hair. They contain multiple different chemicals, some of which may be EDCs or carcinogens (e.g., aromatic amines). Occupational use of hair dyes containing aromatic amines has been classified as a probable carcinogen (IARC category 2A). The use of hair dyes may also increase breast cancer risk.

**Heavy metals** such as **lead, cadmium, antimony, arsenic** and **mercury** may act as endocrine disruptors known as metalloestrogens. Heavy metals may be present in certain types of plastic bottles and pots or takeaway boxes. They may also be released into the environment during combustion. Exposure to certain heavy metals has been shown to increase the risk of breast cancer. Some heavy metals are recognised carcinogens (IARC category 1).

**Homosalate** is a chemical UV filter used in sunscreen and other products to prolong shelf life. It is a suspected EDC which can affect male and female sex hormones and may increase breast cell proliferation, migration and invasion.

**Imazalil** (or **enilconazole**) is a fungicide used to treat fruit, especially citrus fruit. Imazalil is a suspected EDC that blocks the production of oestrogen causing changes in the levels of sex

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hormones in both cells and animals. In the US, it is classified as a probable carcinogen.

**Malathion** is an insecticide used in agriculture to control mosquitoes. It is also present in some products for the treatment of head lice and mites. It is classified as probably carcinogenic (IARC category 2A) to humans and may have oestrogenic effects. In animals, it was shown to disrupt the development of the mammary gland. Occupational exposure may increase breast cancer risk.

**Nonylphenols** and **alkylphenols** are environmental pollutants. They were used in detergents, cosmetics and agricultural products, but have been restricted since 2003. Despite this, they still contaminate the environment and are found in body fluids. Nonylphenol is officially recognised as an EDC by the EU, and occupational exposure to alkylphenols may increase breast cancer risk in both males and females.

**Octocrylene** is a chemical UV filter used in sunscreen and may also be used with other chemicals to prolong shelf life in other products. Octocrylene may have EDC properties, and has been banned in Hawaii due to its environmental toxicity. It can also break down forming benzophenone, which is a carcinogenic chemical (IARC category 2B).

**Parabens** (**methylparaben**, **propylparaben**, **ethylparaben** and **butylparaben**) are preservatives found in cosmetics, toiletries and menstrual products. They may also be present

in certain processed foods listed as **E214**, **E215**, **E218** and **E219**. Parabens are EDCs that may mimic the actions of oestrogen or increase its levels. Some parabens are officially recognised as EDCs by the EU.

**Parfum** (or **perfume**) is a mixture of different chemicals used to give a scent to cosmetics, toiletries and cleaning products. It may include harmful chemicals, such as phthalates and synthetic musks. In the ingredient label, the individual chemicals are not listed and the terms **fragrance**, **parfum** or **perfume** may be used.

**Pesticides** are chemicals used to control pests, weeds and diseases. They include herbicides, insecticides and fungicides. Some banned pesticides were found to increase breast cancer risk in humans (e.g., DDT) and to alter the mammary gland development in animals (e.g., chlorpyrifos). Some pesticides still in use are EDCs (e.g., propiconazole, DBNPA) or carcinogenic to humans (e.g., atrazine, alachlor, vinclozolin; IARC category 2A and 2B).

**PFAS** (or **forever chemicals**) are a group of chemicals used to make non-stick, waterproof and stain- and grease-resistant materials including cookware, food packaging, clothing and furniture. One of the most well-known PFAS is the polymer **PTFE** used in non-stick pans. PFAS are environmental pollutants and may accumulate in the human body. Some PFAS have EDC properties and may increase breast cancer risk. Some are also carcinogens (IARC categories 1A and 2B).

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**Phthalates** are a class of chemicals used as additives in PVC plastic (recycling code 3) or as fragrance ingredients in cosmetics. They may be found in products such as flooring, shower curtains, food packaging and menstrual products. Phthalates are EDCs that may interfere with both male and female hormones. Some are toxic to male reproduction and may increase breast cancer risk. Some phthalates are officially recognised as EDCs by the EU.

**Polychlorinated bisphenols (PCBs)** are highly persistent pollutants. The production of PCBs has been banned since the 1980s but they can still be found in the environment. Some PCBs are EDCs that may interfere with oestrogen. Exposure to specific PCBs may increase breast cancer risk, whilst others are not linked.

**Polycyclic aromatic hydrocarbons (PAHs)** are a group of harmful chemicals produced from the burning of fuels, gas and waste. They are also formed while smoking tobacco or grilling meat. Some PAHs are classified as carcinogens (IARC categories 1 and 2B). They may have EDC properties and may also increase breast cancer risk.

**Polycyclic synthetic musks**, such as **hexamethylindanopyran** (or **HHCB**, **galaxolide**) and **acetyl hexamethyl tetralin** (or **AHTN**, **tonalide**) are fragrance ingredients used in cosmetics, toiletries and cleaning products. They can interfere with both male and female hormones and are currently under assessment as EDCs in the EU. They may also accumulate in the environment.

**Triclocarban** is a preservative that may be used in cosmetics, toiletries and cleaning products to stop the growth of microorganisms. It may also be added to plastic. In cell studies, it was shown to alter the synthesis of hormones and their activity. In 2016, the US banned its use in antibacterial soap. In 2022, the EU recognised it may have EDC properties and banned its use in mouthwash.

**Triclosan** is a preservative that may be used in cosmetics, antibacterial soaps, toothpaste and cleaning products to stop the growth of microorganisms. It is no longer commonly used in the EU and UK after it was banned in 2016, although it may still be in our environment. It is under assessment as an EDC in the EU and may affect breast cancer progression in animals.

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A complete list of references, the inclusion criteria and strength of evidence can be found [here](#).

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**Disclaimer:** This work in no way claims to be a comprehensive treatment of the subject of all chemicals that may be associated with breast cancers or their uses and sources. Breast Cancer UK has used all reasonable endeavours to ensure that the content of this document is correct at the time of publishing, but no warranty is given to that effect, nor any liability accepted for any loss or damage arising from the use of this leaflet or information on this website.