

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 may be linked to breast cancer or interfere with the endocrine (or hormone) system. Chemicals that interfere with hormones are Endocrine Disrupting Chemicals (EDCs), and they may interfere with 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](#)—you can use our handy A to Z lists to check ingredients when shopping. However, other products, such as [Plastic](#) items, [Furniture](#), and [clothes](#), don't need to disclose the presence of chemicals; thus, these are [not on 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
- musk ketone
- musk xylene
- 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
- PTFE

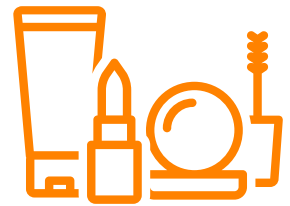
A to Z Chemicals of Concern

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
- methenamine
- 4-methylbenzylidene camphor
- methylparaben
- musk ketone
- musk xylene
- octocrylene
- parfum
- perfume
- propylparaben
- PTFE
- sodium hydroxymethylglycinate
- 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
- methenamine
- 4-methylbenzylidene camphor
- methylparaben,
- musk ketone
- musk xylene
- octocrylene
- parfum
- perfume
- propylparaben
- sodium hydroxymethylglycinate
- triclocarban
- triclosan



A to Z Chemicals of Concern

On labels

Food additives:

A-Z

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



Not on labels

Furniture and clothes:

- flame retardant
- 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

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 affect breast cancer risk.

Benzophenones are chemical UV filters used in suncream. They may also be found in washing and cleaning products, or in plastic products and textiles to prevent ageing. **Benzophenone-3** (or **oxybenzone**) is toxic to the environment and has been phased out or banned in certain countries. **Benzophenone-4** may be added to beauty products and toiletries to prolong shelf life. Benzophenones have oestrogenic properties in cells and benzophenone-3 is under assessment as EDC in the EU.

Benzyl salicylate is an 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 was shown to cause breast cancer cell proliferation, however the evidence of its EDC properties is so far limited.

Bisphenols are additives in products made of polycarbonate plastics (recycling code 7). They may also be found in internal linings of tins and cans and in some till receipts. **Bisphenol A** (**BPA**) is officially recognised to be an EDC 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 such as **cyclohexasiloxane** (**D6**), **cyclopentasiloxane** (**D5**) and **cyclotetrasiloxane** (**D4**). They are used as solvent carriers, conditioning and spreading

A to Z Chemicals of Concern

agents in beauty products and toiletries. They are persistent, bioaccumulative and may interfere with hormones and be toxic for reproduction. In the UK, D4 and D5 have been banned from wash-off cosmetics, with a proposal to include D6 and leave-on cosmetics.

Deltamethrin is an insecticide used in agriculture classified as a moderately dangerous insecticide. Deltamethrin has been shown to accumulate in fat tissue near mammary tumours in female dogs. It also has oestrogenic and antiandrogenic activity.

2,4-dichlorophenoxyacetic acid (2,4-D) is a 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.

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 suncream and may also be used in other beauty products to prolong shelf life. 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 suncream, 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.

Flame retardants are chemicals used to prevent or slow down fire. They are used in electronics, vehicles and furniture. Brominated and organophosphorus organic flame retardants may be EDCs, bioaccumulative or suspected of being carcinogenic. Some may also increase breast cancer risk.

Forever chemicals see PFAS section P.

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.

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

A to Z Chemicals of Concern

terms of fragrance, **parfum** or **perfume** may be used.

Glyphosate is a 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 accelerate breast cancer progression. Some heavy metals are recognised or suspected to be carcinogens.

Homosalate is a chemical UV filter used in sunscreen and other products to prolong shelf life. It is an 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 an

EDC that blocks the production of oestrogen causing changes in the levels of sex hormones in both cells and animals. In the US it is classified as likely to be carcinogenic in humans.

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 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.

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. In 2022, it was officially recognised as an EDC by the EU. In the UK, the process to evaluate its safety started in 2023.

Nitro musks such as **musk xylene** and **musk ketone**, are fragrance ingredients and may be used in cosmetics, toiletries and cleaning products. They may have oestrogenic activity and may accumulate in the environment and human body. They are also suspected to be carcinogens.

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. They

A to Z Chemicals of Concern

have oestrogenic properties 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 in other products to prolong shelf life. Octocrylene may have EDC properties and some states have banned it, due to its environmental toxicity. It can also break down forming benzophenone, which is a carcinogenic chemical.

Parabens (methylparaben, propylparaben, ethylparaben and butylparaben) are preservatives found in cosmetics and toiletries. 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, which are restricted and not listed here, are recognised to be 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 may be EDCs and/or carcinogenic to humans.

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 specific PFAS have EDC properties and may increase breast cancer risk.

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 and food packaging. 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 have been restricted by the EU and UK due to being harmful EDCs.

Polychlorinated bisphenols (PCBs) are highly persistent pollutants. They were banned since the 1980s but 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 possible human carcinogens. They may have EDC properties and may also increase breast cancer risk.

A to Z Chemicals of Concern

Polycyclic synthetic musks, such as **hexamethylindanopyran** (or **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 the US, it has been banned from some products, such as soap.

Triclosan is a preservative that may be used in cosmetics, toiletries and cleaning products to stop the growth of microorganisms. It is officially recognised as an EDC and has been banned from food contact material. It may also be implicated in mammary tumours in animals.

The supporting document, inclusion criteria and references to this 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.