



## BISPHENOLS: WHAT YOU NEED TO KNOW

### WHAT ARE BISPHENOLS?

Bisphenols are a group of man-made chemicals that are used in the manufacturing of polycarbonate plastics and epoxy resins. The most widely used chemical in the group, produced in high volumes, is bisphenol A, also known as BPA.

The use of other bisphenols, such as bisphenol S (BPS) and bisphenol F (BPF) is limited in comparison, although volumes are increasing as these chemicals are being used as replacements for BPA in some products, following restrictions on the use of BPA.

POLYCARBONATE  
PLASTICS MAY CARRY  
ONE OF THE FOLLOWING  
PICTOGRAPHS:



POLYCARBONATE

OTHER

### How are bisphenols used?

BPA is used as a building block in the production of polycarbonate plastics. The resulting plastic is clear and tough and is used in the manufacture of a wide range of consumer goods, including sports equipment, CDs, DVDs, impact-resistant safety equipment and automobile parts. BPA-based plastic is also used in food containers, such as reusable beverage bottles and reusable plastic tableware.

Another primary use of BPA is to produce epoxy resins. These resins are used to line food and beverage cans to avoid corrosion of the metal and to avoid migration of certain metals into the contents. They are also used to line water pipes and in the manufacture of thermal papers used for shop sales receipts, ATM receipts, public transport tickets, parking tickets and airline boarding passes. Finally, BPA is used in dental sealants.

In terms of other bisphenols, both BPS and BPF are also used in the manufacture of plastics. In particular, BPS is increasing used in the production of thermal papers. This is driven by an upcoming ban on the use of BPA in thermal papers in the European Union due to enter into force in January 2020.

### How can bisphenols enter your body?

Most human exposure to BPA is through the consumption of food and beverages that have been in contact with epoxy resin linings or polycarbonate plastic containers. Food or drinks may contain very low levels of BPA that have migrated from containers and linings. Small children have an increased risk of becoming exposed to BPA due to their higher food consumption compared to their size.

People may also become exposed via the skin by handling thermal papers, such as till receipts. Limited exposure may also occur through breathing in contaminated air and dust. Once BPA enters the human body, it is rapidly broken down into metabolites and passes out of the body in urine.

### UNDERSTANDING CHEMICAL RISK

The **risk** of harm from any chemical results from the hazard associated with the chemical, combined with exposure to the chemical.

**Hazard** refers to the properties of the chemical that make it toxic, meaning it can cause harm to human health.

**Exposure** describes the amount of a chemical that an individual comes into contact with, as well as the frequency of exposure.

The term **threshold** is used to indicate the concentration, or level, of a chemical to which people according to current knowledge can be exposed without suffering negative health effects. Exposure up to this level is considered safe. Some chemicals can cause health effects at any concentration and are considered as having no threshold. For such chemicals, no level of exposure is safe.

### How might bisphenols affect health?

BPA is classified in the European Union (EU) as a substance that has toxic effects on our ability to reproduce, meaning that it may damage fertility or the unborn child. It is also classified as an endocrine disrupter, meaning that it can interfere with the functioning of the hormonal system. Identification of these hazards led the EU to take measures to reduce exposure to BPA.

Evidence from scientific studies suggest that exposure to BPA could be linked to obesity and diabetes, and may cause adverse effects to the immune system. Despite the wealth of studies, questions remain regarding the health impacts of BPA and the exposure levels and durations at which these impacts occur.

BPS is suspected to have many of the same adverse health effects as BPA, and is currently under evaluation by the European Chemicals Agency.





## Human exposure to bisphenols in Europe

To understand human exposure to bisphenols, their breakdown products are measured in urine.

Human biomonitoring studies have found BPA in the blood or urine of the populations surveyed, suggesting that the large majority of the European population is continually exposed to low doses of BPA.

However, the presence of bisphenols in a person's urine does not necessarily mean their health has been harmed. If the level of exposure is below the threshold considered to be safe, then no adverse effects on health are expected.

In 2015, the European Food Safety Authority undertook an evaluation of the public health risks of BPA in foodstuff. They established the level of BPA that it is safe to ingest on a daily basis, known as the tolerable daily intake, and compared this to estimates of human exposure to BPA. They concluded that BPA does not pose a health risk to consumers at current exposure levels.

New scientific evidence regarding the hazards of and exposure to bisphenols has become available since 2015 and the European Food Safety Authority is now re-evaluating BPA, in order to take this new evidence into account. The new assessment should be completed by 2020.

**Human biomonitoring involves taking small samples of blood, urine or hair and measuring the concentration of a chemical in the sample. The measurement determines the total amount of a chemical in the body, representing input from all possible sources. Samples are taken preferably from large numbers of people, in order to get a picture of exposure in a certain population.**

### What is HBM4EU doing on bisphenols?

HBM4EU is working to answer the following key questions on bisphenols, to inform an evaluation of possible risks to human health and support safe use.

- What is the current exposure of the EU population to bisphenols?
- Is this level of exposure a concern for health?
- Do BPS and BPA pose risks to public health?
- Are children more at risk?

For more information, please see the HBM4EU webpage on bisphenols.

## How can you reduce your exposure to bisphenols?

If you are concerned, you can take the following steps to reduce your exposure.

- Avoid using polycarbonate containers for hot food or drinks and avoid microwaving food in plastic containers. More BPA migrates from food and beverage containers if they are hot or boiling. It is important to follow the specific instructions on each container, to avoid misuse.
- Do not use damaged plastic food containers. If food containers or bottles are scratched or damaged on the inside, BPA may be released into the food or liquid.
- Limit your consumption of canned food.
- Avoid touching thermal till paper, as BPA can get onto your hands.
- You have the right to ask the supplier of any product whether it contains BPA in a concentration above 0.1%. The supplier must provide you with this information within 45 days of your request, as well as information to allow you to use the product safely.

## How is the European Union protecting citizens?

The EU has taken action to reduce citizen's exposure to BPA.

- BPA has been banned from infant feeding bottles across the EU since 1 June 2011.
- While BPA is permitted for use in materials that come into contact with food in the EU, there is limit on how much is allowed to leach out of the material into food.
- The EU set a limit on the amount of BPA that is allowed to leach out of toys for children up to the age of three and in any toys that are intended to be placed in a child's mouth.
- BPA will be restricted in thermal paper in the European Union from 2020.
- Further studies are being undertaken to investigate the safety of BPS as a replacement for BPA.

