

Should we worry about phthalates?

- Phthalates are man-made chemicals that are widely used in everyday items, mainly PVC (polyvinyl chloride) plastic.
- They are widely used in everyday items.
- There have been some concerns about the safety of their use with regards to human health because studies have shown that some phthalates may have caused harm to the reproductive system.
- But many of the studies used extremely high doses of phthalates; much higher than the levels experienced in our homes and in the environment. There is a great deal of controversy over whether some phthalates may be able to cause harm to humans in very low doses.
- To be on the safe side, the EU has taken a precautionary approach and introduced measures to reduce our exposure to phthalates.



What are phthalates?

Phthalates are a group of man-made chemicals. They are mainly used as plasticisers; they are added to plastic to make it softer and more flexible. More than 90% of phthalates produced are added to a specific type of plastic: polyvinyl chloride (PVC). PVC is used in many products, including packaging, stationery, toys, medical devices, clothing, electrical cable insulation, roofing and shower curtains. Phthalates have also been used to help prevent nail varnish from chipping, make perfume last longer and make tool handles stronger and more resistant to breaking. Other uses involve helping adhesives, sealants, paints and many other products to be more effective.

In short, phthalates are all around us and most of us will come into contact with products that contain them on a daily basis.

Should we worry about phthalates?

Some of what you might have read or heard about phthalates may have been conflicting or confusing, exaggerated or only part of the story ...

How do phthalates get into our bodies?

Inhalation and ingestion are the main routes of exposure. Very small amounts of phthalates can leach out of plastics. Because phthalates are used in building materials they can accumulate in dust. We breathe in dust, so we can inhale small amounts of phthalates. Trace amounts of phthalates can also leach out of food packaging and get into the food.

Did you know?

Phthalate is pronounced 'tha-late'.

Did you know?

There are many different phthalates and they tend to have long chemical names. Usually, their shorter acronym will be used instead. For example, you may notice di-2-ethylhexyl phthalate being shortened to DEHP.



Should we
Worry About ?

Phthalates and cancer

You may have heard some reports linking phthalates to cancer. However, no phthalates have been classified as 'carcinogenic to humans' by the International Agency for Research on Cancer (IARC). One phthalate, di-2-ethylhexyl phthalate (DEHP), has been classified as 'possibly carcinogenic to humans' but there is no conclusive evidence that any phthalates cause cancer.

Are phthalates endocrine disruptors?

Endocrine disruptors are chemicals that interfere with the body's hormone system. Phthalates are often quoted as being endocrine disruptors and occasionally sensationally referred to as 'gender-bending' chemicals. This is because some scientific studies suggest that certain phthalates reduce production of the hormone testosterone. The following phthalates may be endocrine disruptors: DBP, BBP and DEHP. Most uses of these phthalates will be phased out in Europe over the next few years.

Do phthalates cause obesity?

There have been several reports in the media warning that there is a link between phthalates and obesity. A study has shown that mice exposed to high doses of certain phthalates became obese. Another study found higher levels of phthalates in the urine of obese children than in children of a healthy weight. However, the current evidence for a link between phthalates and obesity is very weak. Phthalates have not been shown to be a cause of obesity in humans.

Reproductive toxicity

At high doses, some phthalates, including dibutyl phthalate (DBP), benzylbutyl phthalate (BBP) and DEHP, have been found to be harmful to the reproductive systems of rodents. However, the doses used during these tests were many times higher than the level of exposure experienced by humans in everyday life. Although phthalates are widely used, humans are only exposed to relatively low levels. There is currently not enough evidence that there are similar harmful effects in humans.

Persistence

Phthalates do not build up (i.e. bio-accumulate) in the bodies of humans or animals. They are metabolised and then excreted. They do not remain in the environment for long periods of time as they are readily biodegradable.



PVC

Did you know?

This is the recycling symbol for PVC. So any plastic with this symbol on it may well contain some phthalates.

What is being done about phthalates?

Most phthalates, in the majority of applications, do not pose a significant risk to human health or the environment. We are exposed to phthalates in our homes, offices and environment. However, the level of exposure that we experience is significantly lower than levels that have been shown to cause harm in rodents.

Nevertheless, the EU has taken some precautionary action to deal with phthalates. The phthalates which have been identified as posing potentially higher risks to human health have been addressed by legislation and their use is being phased out in Europe.

Phthalate	Uncertainties or concerns	What is being done in the EU?
DEHP (di-2-ethylhexyl phthalate)	<ul style="list-style-type: none"> • Possibly carcinogenic to humans • At high doses has been shown to harm the reproductive system of rodents 	Not permitted for use in cosmetics or toys. Restrictions for use in food packaging. The majority of uses of these phthalates will be phased out over the next few years.
DBP (dibutyl phthalate)	<ul style="list-style-type: none"> • At high doses has been shown to harm the reproductive system of rodents 	
BBP (benzylbutyl phthalate)		
DINP (diisononyl phthalate)	<ul style="list-style-type: none"> • No definite risks have been identified for the applications of these phthalates but there are some uncertainties. 	Restrictions for use in food packaging and certain toys.
DIDP (diisodecyl phthalate)		Restriction for use in certain toys.
DNOP (di(n-octyl) phthalate)		
DIBP (diisobutyl phthalate)	<ul style="list-style-type: none"> • Suspected of causing harm to the reproductive system and/or the unborn child at high doses. 	The use of DIBP in the majority of applications will be phased out over the next few years.
DMEP (di(methoxyethyl) phthalate or bis(methylglycol) phthalate)	<ul style="list-style-type: none"> • Suspected of causing harm to the reproductive system and/or the unborn child at high doses. 	These phthalates are likely to be phased out over the next few years.
DIHP (diisooheptyl phthalate)		
DHNUP (1,2-benzenedicarboxylic acid, di-C7-11 – branched and linear alkyl esters)		

Food

The EU established that the exposure of humans to some phthalates was close to the calculated tolerable daily intake (TDI). The TDI is the amount of a substance that is safe to consume every day over a lifetime. For this reason, the EU introduced restrictions on the use of phthalates in food contact applications. The extent of the restriction depends on the phthalate in question and the type of food involved. The length of time the food is intended to come into contact with the plastic is also a factor. Phthalates migrate, or leach out, more easily into fatty foods than into non-fatty foods. In addition, specific migration limits for phthalates into the various food types must be met. This means that the company that manufactures the plastic must carry out safety tests. The tests must show that the phthalates do not get into the food at levels that are considered to be too high.

Toys

The EU considers young children to be particularly vulnerable to the potential reproductive toxicity of phthalates. This is because they are smaller than older children and adults and their metabolic systems are not fully developed. They decided that because of this, the exposure of children to all avoidable sources of these chemicals should be reduced. The use of DBP, BBP and DEHP has been banned in toys and childcare articles. DINP, DIDP and DNOP can only be used in toys that cannot be placed in the mouth.

Cosmetics

The phthalates DBP, BBP and DEHP are not permitted to be used in cosmetics in Europe.

Blood bags

Although most uses of DEHP are to be phased out over the next few years, there is one important application that has been exempted from this ban. In Europe, DEHP is the only plasticiser permitted for use in blood bags. This may seem surprising but there are so many benefits in using DEHP for this application that regulators consider the benefits to outweigh the risks.

PVC that is treated with DEHP is strong, light, and tear and heat resistant. The DEHP also helps to soften the plastic, which is important because it allows the blood bags to be easily squeezed by hand.

Someone who receives blood from one of these blood bags would only be exposed to an extremely low level of DEHP. This level is much lower than the amount that has been shown to cause harm. At the moment there are no suitable alternatives to DEHP, so it will continue to be used for this purpose.



Did you know?

Phthalates cannot leach out of bottles containing water or fizzy drinks. These bottles are made of a different type of plastic, polyethylene terephthalate (PET), which does not usually contain plasticisers. Despite its similarity in name, it is chemically very different, from plasticiser phthalates.



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