

Frequently Asked Questions

What is EA?

Estrogens are often called female sex hormones, but they are also found in men. Chemicals are said to have estrogenic activity (EA) when they bind to and activate estrogen receptors in cells.

What are endocrine disrupting chemicals (EDCs)?

Endocrine disrupting chemicals (EDCs) are chemicals that mimic (or block) the action of hormones such as estrogens, androgens, and thyroxins. By far the most common form of hormonal activity in EDCs is EA. Several thousand xenobiotic chemicals are suspected to have EA. The most widely publicized EDC having EA is bisphenol-A (BPA), used to make (and released from) polycarbonate containers, can liners, and other products. Other examples of EDCs having EA are parabens in cosmetics and drugs, alkyl-phenols in soaps and paper products, and phthalates in many soft plastics. In fact, these and many other EDCs leach into the environment from a variety of consumer packaging products, foods, beverages, cosmetics, and personal care goods and can be consumed by people or pollute our environment.

Do you have any EA-free products to buy?

PlastiPure has worked with companies and government agencies to develop EA-free products including water bottles, infant feeding products, packaging, cosmetics, and housewares. Unfortunately, commercial companies have resisted completing developing and releasing PlastiPure-Safe™ EA-Free products. We believe these companies and others do not want to bring attention to their current products, which may be leaching chemicals with EA, by launching and promoting demonstratively safer EA-free products.

PlastiPure is a technology company and has traditionally not developed in-house products, but we have received so many requests for producing EA-free consumer products that we recently decided to spin off a consumer products company, *productpure*™. *productpure*™ is now developing and will shortly be producing highly requested EA-free products based on a more comprehensive safety standard, PlastiPure-Safe™ EA-Free.

Can you tell me more about *productpure*™ EA-free products?

productpure™ will begin releasing products in 2015. Its first product, a PlastiPure-Safe™ EA-Free baby bottle is scheduled for piloting in August 2015 and widespread commercial release immediately after. A reusable water bottle is also being developed and should be released shortly after the baby bottle. The research behind these safer products has been partially funded through several million dollars in grants from the National Institute of Health and the National Science Foundation. For more information on *productpure*™ and its products, please see www.productpure.com.

Isn't it enough to just avoid a few chemicals, like BPA?

No. Avoiding BPA and few other widely publicized EDCs does not address the other thousands of potentially harmful chemicals having EA that could leach from plastics and other materials into the food and water we consume every day. This is why current legislative attempts to solve this problem by banning chemicals having EA one at a time – BPA, for instance — are not an effective solution.

A recent peer-reviewed study showed that over 90 percent of BPA-free products and materials tested were positive for EA. Companies that respond to short-term market forces, like the push for BPA-free, versus meeting a more

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comprehensive standard such as EA-free, will likely have to repeatedly reengineer those products to address other chemicals having estrogenic activity.

Why focus on chemicals that have EA?

While some chemicals having EA occur naturally in the body and in some foods, many scientific studies have shown that significant health problems can occur when additional amounts of xenobiotic EDCs are ingested. Eliminating specific chemicals like as BPA one at a time does not reduce or eliminate the presence of many other EDCs with EA. Improved safety can only be ensured when a comprehensive approach is implemented to address EA in consumer products.

What types of consumer products can leach chemicals having EA?

Many modern plastics, silicones, elastomers, processing aids, colorants, additives, and other materials and chemicals used in widely sold products like:

- Water and baby bottles
- Food containers
- Plastic bags and wraps
- Dental materials
- Diapers
- Medical devices and supplies
- Breast milk pumps and bags
- Personal care and cosmetics
- Filler for supplements
- Tableware
- Soaps
- Food additives
- Animal feed
- Paper and wood
- Metal and paper liners

How are people likely to be exposed to EA?

Chemicals having EA can leach from consumer products and packaging into the water and food we consume, cosmetics we apply, additives in our foods, and many other sources. These and other products can also pose a hazard by leaching estrogenic chemicals into our landfills and water tables, thereby contaminating our environment.

Are chemicals having EA dangerous?

Numerous articles in scientific journals published over many years have reported that chemicals having EA can produce higher rates of some cancers, early puberty in females, diminished fertility, obesity, behavioral disorders, birth defects, and many other health disorders. This is an active research area, where scientists are trying to better understand the scope and magnitude of the health risks. The fetus, newborn, or young child is especially vulnerable to trace amounts of these chemicals. Synthetic chemicals with EA are clearly a significant hazard to be avoided when possible for most people.

Is FDA approval of materials or products enough to ensure safety?

We don't think so. The FDA and other governmental agencies do not have a standard for EA safety. The US does not employ the "precautionary principle," which states that chemicals must be proven safe in order to be allowed for use. The default assumption in the US is that chemicals are safe unless proven otherwise.

Pesticides and prescription medications go through an FDA approval process, though plastics and other food and beverage packaging can be self-certified by the companies producing them if they are in compliance with FDA regulations on a limited number of specific chemicals. For example, despite public and scientific concern, it is still legal to manufacture many FDA-compliant products with BPA in the USA.

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How can the problem of EA be solved now?

PlastiPure can work with material and product manufacturers today to make certified PlastiPure-Safe™ EA-Free products today. PlastiPure can identify or formulate EA-free materials and provide production methods without need for new tooling or specialty chemicals. These solutions can be immediately implemented by product manufacturers and retailers today.

Consumer demand will quickly change markets from one-at-a-time chemical-by-chemical avoidance (e.g., BPA-free, phthalate-free, or paraben-free) to the comprehensive solution of EA-free much faster than legislative regulations (e.g., banning all chemicals with EA from use in consumer products). In the past, for instance, consumer safety demands led to retailers and manufacturers eliminating lead in most child products well before any legislation, and more recently switching away from the use of BPA in baby bottles years before the FDA issued vague and inconsistent warnings about this chemical.

How Does PlastiPure create EA-free solutions?

We evaluate thousands of materials and products for the presence of chemicals with EA. We know many materials that have EA, and we have identified EA-free replacements with similar physical and chemical properties, such as heat resistance, softness, etc. We work with product manufacturers to remove the harmful components and replace them with safer materials. We also know the methods to process and test products that greatly reduce the chance of chemicals with EA be introduced into consumer goods. In most cases, the physical, chemical, and aesthetic characteristics of EA-free products are indistinguishable from current products while still being price competitive.

Has PlastiPure made plastic resins?

No. While PlastiPure has at times formulated new materials, we do not ourselves manufacture resins. We work with resin manufacturers, processors, and product companies to ensure that their products are (or can be made) comprehensively EA-free.

Are companies embracing EA-free alternatives?

PlastiPure has talked to many product manufacturers in multiple industries and know that they are largely aware of the research that shows that chemicals with estrogenic activity can readily leach from products and the potential harm that it can cause to humans. While some companies are eager to learn more and investigate solutions, most companies seem to hope that consumers remain in the dark about potential risks of using products that release chemicals having EA. Many firms used this approach (and some still do) when the first concerns about BPA arose. Such attitudes change only when consumers demand that product manufacturers and retailers provide EA-free products.

Should plastic products be avoided completely?

The practical answer to this question is “What would replace plastics?” Plastics have many advantages. They are highly customizable, easy to process, lightweight, low cost, and have clarity, strength, and recyclability. Using PlastiPure’s processes, they can be made remarkably safer. Simply avoiding and replacing plastics is not the answer, because PlastiPure scientists and other researchers have found chemicals having EA in many commercial products that are not plastic, such as glass, metal, silicone, wood, paper, food additives, personal care products, and cosmetics. We believe it

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is safest for consumers to focus on products that have reliably evaluated by trusted entities like PlastiPure and found not to leach EA. PlastiPure lets consumers know which products have passed its rigorous tests by certifying them as PlastiPure-Safe™ EA-Free.

Where can we find data on EA?

PlastiPure has published much of its data in peer-reviewed scientific journals. The articles can be found on its website, PlastiPure.com. In addition, some of its clients, such as the Center for Environmental Health, have published data from us and our partners. Finally, PlastiPure is working toward a web-based release of more product-specific data in the near future.

Since many companies have not yet tested their products for EA, are there any general rules of thumb to help consumers who may be purchasing untested products?

While there are many exceptions to these guidelines, PlastiPure can make high-level recommendations based on its predictive models and data compiled over a decade:

- Many colorants and inks leach high levels of EA. Avoid untested colorants and inks when possible, especially colorants that change color with heat/cold.
- Softer plastics such as polypropylene or polyethylene are not as likely to leach as much EA as untested harder and clearer plastics such as polycarbonate (PC), polystyrene (PS), or polyether sulfone (PES).
- Elastomers such as latex, silicone, and synthetic rubbers can leach significant amounts of EA.
- Glass and stainless steel materials tend to not leach EA, but PlastiPure has observed exceptions to these results. Also, be aware that a glass bottle may have a lid or straw that can leach EA, or that a metal container may have a liner that leaches EA.
- The stress that PlastiPure has seen that is most destructive to plastics and other materials is ultraviolet light. UV from different sources such as sunlight can break plastics down creating new chemicals having EA that were not in of the original product. This is one of the reasons companies should not make safety claims on their products without subjecting them simulated long-term environmental stresses.

If a product tests as EA-free, will it always be EA-free?

Not necessarily. If a company changes the materials or processing of a product it may no longer be EA-free. This is why PlastiPure provides an ongoing certification process for companies to maintain their official PlastiPure-Safe™ EA-Free status. PlastiPure's EA-free standards will likely become more rigorous over time as new technology allows us to detect and remediate ever smaller levels of EA.

How should I evaluate a company that declares their own products to be EA-free?

Consumers should look for transparency in the claims that a product manufacturer makes about their own products. How was their product tested? What were the results? Is this a trusted entity? Companies like PlastiPure that publish their methods and data in peer reviewed publications have a high level of transparency that should let consumers know that they can trust the testing results and EA-free claims. Ultimately, consumers have to make a choice on which studies and standards they trust.

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With highly sensitive testing designed to detect EA, PlastiPure promotes a very stringent standard, PlastiPure-Safe EA-Free™, to better ensure the safety of products. But even the PlastiPure-Safe™ EA-Free certification standard has changed over time, reflecting our ability to detect EA at ever smaller concentrations.

Are you the only company that does this kind of testing?

No. But the PlastiPure-Safe™ EA-Free standard is the one the consumer can trust. Often, manufacturers may want to work with a testing company that promises “guaranteed results” ... in other words, testing with the goal of *not* finding anything so the manufacturer can say “testing shows we’re safe.” Testing methods vary widely, and simply saying that a product has been tested is not enough. Those tests need to adhere to a certain standard, and PlastiPure’s testing is designed to detect EA in ever-smaller amounts, not to tell a manufacturer what they want to hear. In addition, PlastiPure has published many of its EA surveys of consumer products along with detailed testing methods in peer-reviewed publications.

How can families keep children safe while using plastic?

The focus should not be solely on plastics, because PlastiPure has found many materials and products testing positive for EA that were not plastics. But as a general rule, look for the PlastiPure-Safe™ EA-Free seal to ensure that the products that given to children have been tested, encourage favorite retailers and manufacturers to seek out PlastiPure-Safe™ EA-Free certification, and follow the rules of thumb given earlier.

In the absence of EA-free products on the market, what’s out there that is safe enough?

Even if PlastiPure has tested a product and found it to be EA-free, we still can’t recommend it until we know that it will be made the same way consistently and that no potential contaminants will be introduced to the product. This is why for PlastiPure-Safe™ EA-Free certification; companies must agree not only to use certain materials in their product, but also to follow an approved process and to submit commercial samples for ongoing testing.

I threw out all my old plastic and bought all BPA-free products...why isn’t that good enough?

Because simply avoiding BPA does not address the other thousands of potentially harmful chemicals having EA that could leach from plastics and other materials into the food and water we consume every day. Also, the chemicals that are substituted for BPA often have EA themselves, sometimes in very significant amounts. We believe that our PlastiPure-Safe standard is the best.

What will happen to my children if I keep using plastic that isn’t EA-free?

No one knows for sure, but many peer-reviewed scientific studies have linked ingestion of chemicals with EA to higher occurrences of a variety of negative health effects, like higher rates of some cancers, altered reproductive functions, early puberty, obesity, learning disabilities, and behavioral changes.

Will you test my child’s water bottle from his lunch box?

We can, but for comprehensive testing of a product, the cost could be a few thousand dollars. PlastiPure is working to provide more specific product data to the public and to create a way for groups of customers to collectively fund testing of a limited number of high-interest consumer products.

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Why can't you just test this one water bottle I'm asking you about?

PlastiPure's internal cost for the comprehensive testing of products is significant. We have limited ability to conduct uncompensated testing.

How can I help get safer plastic products to the stores?

Talk to your favorite retailers about carrying PlastiPure-Safe™ EA-Free certified products and contact your favorite manufacturers to ask them to work towards achieving the PlastiPure-Safe™ EA-Free certification. Talk to consumer groups and the press. Be active in promoting the cause of safer, EA-free products online. Keep up with the continuing discussions on these topics and actively participate in sharing information about the need for safer plastics and other materials.

In addition to this advice, actively communicate with *productpure™*. PlastiPure has incubated and spun off this company because product manufacturers are not rapidly moving forward to embrace the higher safety standard of EA-free. *productpure™* will begin offering products to address consumers' frequent requests for safer products. Be sure that *productpure™* knows which products you want so they can prioritize their development. If you find *productpure™* consumer products desirable, then actively support this company with your business. The success of *productpure™* likely means conversion to EA-free for many other companies. When consumers preferentially buy EA-free products, how can other manufacturers compete if they refuse to meet this higher safety standard? Consumers have rapidly converted multiple industries (e.g., infant feeding, reusable water bottle, and food storage) to BPA-free with their preferential buying of BPA-free versus BPA-containing polycarbonate. Consumers can again rapidly change markets when given a choice of products that are truly EA-free.

Note that answers given in this FAQ are based on PlastiPure's experience in evaluating and remediating substances which can leach chemicals having detectable EA. Comments concerning safety use published scientific articles as a basis for our statements.