PLASTIPURE®
SAFE
EA-FREE PLASTIC

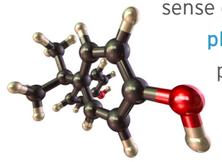
EA-Free Plastic Products: Beyond BPA-Free

The New Safety Standard in Plastics: PlastiPure-Safe™ EA-Free

Consumers have begun to learn about the potential health and environmental hazards associated with synthetic chemicals having Estrogenic Activity (EA) used in many plastic products. Many well-publicized reports have shown that BPA, phthalates, and parabens have easily detectable levels of EA.

But few consumers understand yet that **these widely publicized chemicals are only a few of the thousands of chemicals suspected of having EA.** At least several hundred of these chemicals are used in various combinations in manufacturing plastics. Many more chemicals having EA are commonly used in materials and compounds such as silicones, latex, elastomers, colorants, inks, additives, and processing aids. **When products are made from or processed using these materials, they frequently leach chemicals having EA into foodstuffs, beverages, lotions, cosmetics, and other consumables, and so are continuously ingested by humans.** When these products are thrown away, they leach these same chemicals into our water supplies and soil, impacting wildlife and our environment.

The current publicity-driven approach to removing chemicals with EA one at a time, as with BPA, has produced a false sense of security for consumers and retailers. **Purchasing plastics with certain recycling numbers or plastics advertised as BPA-free does not address the underlying health issues.** Most "BPA-free" products on the market leach other chemicals having EA. Leaching can greatly increase when the products are subjected to common-use stresses like sunlight, dishwashing, or microwaving. BPA-free replacement products often leach chemicals whose total EA is equal to or greater than the original BPA-containing polycarbonate-based product.



In a recent market survey, PlastiPure tested samples of 15 premium-brand BPA-free baby bottles. The results were disturbing: all 15 baby bottle samples showed easily detectable EA. In almost all cases, both the bottle and nipple leached chemicals having EA, and in more than half, EA levels were equal to or greater than polycarbonate bottles with BPA. **Consumers should be aware that BPA-free definitely does not mean EA-free.**

In testing thousands of plastic products, PlastiPure has found a surprising number – 92 percent – leached chemicals having significant levels of EA. A systematic program for EA detection, remediation, and certification is needed to ensure that consumers are provided with products certified to be EA-Free by accurate, sensitive, and verifiable tests.

Long before the potential hazards of BPA became well publicized, PlastiPure worked with its partners to develop techniques to predict, detect, measure and eliminate the use of chemicals having EA. Supported by more than 10 grants from the National Institutes of Health and the National Science Foundation and employing and collaborating with internationally known polymer scientists, chemists, biochemists, and biologists, PlastiPure and its key partners have spent the past decade developing physico-chemical models, robotized bioassays, and production methods.

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Today, PlastiPure uses its unique, innovative, and patented technologies to help its partners make safer products that do not release chemicals having detectable EA. **PlastiPure shows consumers that these products meet its highest standards by placing the PlastiPure-Safe™ EA-Free seal on consumer products and packaging.**

PlastiPure works with companies in multiple industries including infant feeding, beverage, personal care, medical supplies and devices, and food packaging. Our current partners with commercial products available in 2010 and early 2011 include Adiri, Water Geeks, ReliaDose, Hydrapak, ReliaBrand, ReliaWrap, and TOPAS Advanced Polymers.

adiri watergeeks ReliaDose Hydrapak TOPAS Advanced Polymers ReliaBrand ReliaWrap

The Health-Based Solution: Manufacturing PlastiPure-Safe™ EA-Free Products

PlastiPure uses its patented methods to work with customers throughout the process of product design, manufacturing, and delivery to ensure that **a newly manufactured product certified to be EA-Free will remain EA-Free throughout its life cycle.** Because the final product contains many chemicals added during many production steps, EA-free materials and protocols are implemented at each stage of the manufacturing process. These EA-free materials and protocols typically add little to the cost of the final product.

Formulation PlastiPure uses its patented molecular models, more than 10 years of testing experience, and its comprehensive database to quickly formulate new materials or remediate existing materials.

Raw materials PlastiPure uses its QSAR predictive models and database of hundreds of monomers, polymers, and additives to source or specify base resins, colorants, and additives to manufacture EA-Free products.

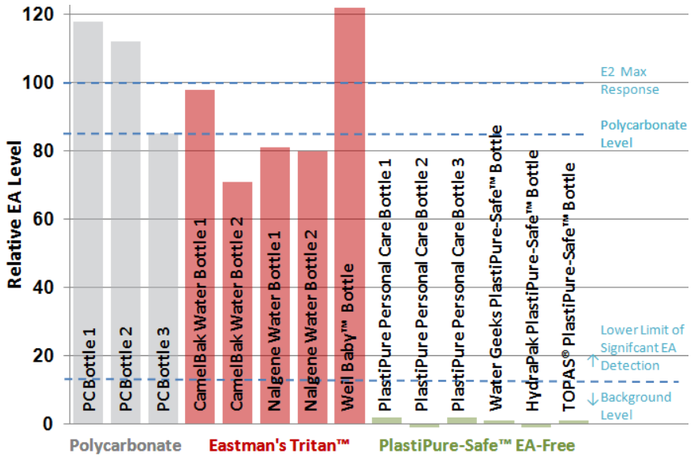
Compounding PlastiPure collaborates with compounders to develop specialty materials and additive concentrates when off-the-shelf materials are insufficient, and to improve productivity, part yield, and reliability.

Processing PlastiPure works with molders, extruders, and thermoformers to adapt procedures to avoid introducing chemicals with EA in clean-out and processing.

Finishing PlastiPure consults on decorating methods and materials, screen printing, in-mold decorating, offset, hot-foil, and pad printing to achieve a final product that is certifiably EA-Free.

Quality assurance As part of its EA-Free certification process, PlastiPure implements a comprehensive test program during product development cycles, pilot manufacturing, and scale-up. Once a product is released, PlastiPure and the customer implement a sampling and test procedure for ongoing quality assurance to maintain PlastiPure-Safe™ EA-Free certification.

Testing It cannot be emphasized enough that **sensitive and accurate testing for very low levels of EA that are linked to negative health effects (in parts per trillion or less) is the key to ensure that products are safe.** Examples of test results of products claiming to be EA-free or made from materials claiming to be EA-free are given in the figure to the right. Most examples are made from Eastman's Tritan™ resin.



Products exposed to common-use stresses of UV and autoclave to simulate sunlight and dishwashing. In this graph, a level of 100 is the maximum response of human breast-derived MCF-7 cells to the estrogen 17ß-estradiol (also known as E2), the predominant female sex hormone which is also present in males.

Marketing PlastiPure certification provides assurance that a product is and will remain EA-Free throughout its lifetime. Our customers and partners get the benefit of competitive material and product data, up-to-date knowledge of testing practices, and state-of-the-art processing methods.

To request a complete white paper and to find additional information on EA, please visit www.plastipure.com
Information on EA and PlastiPure-Safe™ products is also available from PlastiPure's partners.

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