

EASTMAN

Eastman Tritan™ copolyester

**Transforming thinking.
Transforming the industry.**

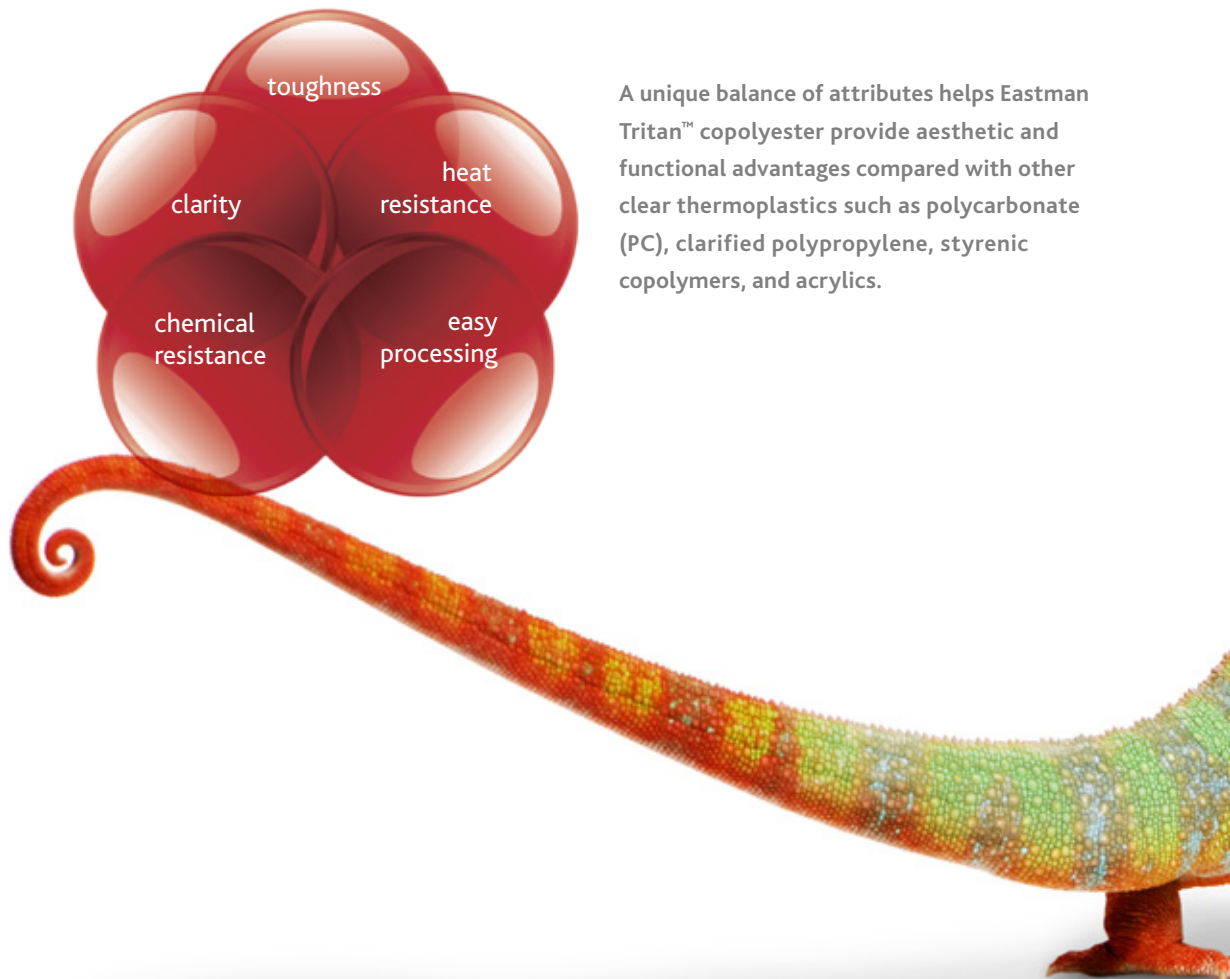


The results of **insight™**

There's something new taking shape.

Every day!

The success of Eastman Tritan™ copolyester has never been about change for the sake of change. Tritan is a new-generation copolyester whose unique balance of processing and performance properties helps customers bring innovative products to market—often with long-term impact on the value of their brands.



A unique balance of attributes helps Eastman Tritan™ copolyester provide aesthetic and functional advantages compared with other clear thermoplastics such as polycarbonate (PC), clarified polypropylene, styrenic copolymers, and acrylics.

A lively introduction. A lasting impression.

Products made from Eastman Tritan™ copolyester have great shelf appeal as well as a perception of quality and value that extends throughout their long life.

Eastman Tritan™ copolyester continues to achieve outstanding customer loyalty and confidence—inspired by unmatched polymer expertise, innovation, and collaborative energy delivered by Eastman.

A tough act to follow.

Many customers return to Eastman Tritan™ copolyester because nothing else adds that same combination of performance and processability to their innovative designs. *How can Tritan help your innovation take shape?*

New expectations for toughness.

Traditionally, PC set the standard for impact resistance and toughness. Eastman Tritan™ copolyester is transforming the definition of toughness. Tritan has impact strength that is comparable to PC while adding chemical resistance, dishwasher durability, and options for complying with market-specific standards for sterilization or hygiene. You simply can expect more toughness from Tritan.



Its value

is shaped by the markets it serves.

The unique balance of attributes of Eastman Tritan™ copolyester is valued by every customer—but Eastman has learned that each designer, engineer, molder, or fabricator may assign a different relative value to each attribute. Depending on customer need, Tritan can add value to existing lines as well as help bring totally new products to market.

Here are some of the markets where it has helped innovations take shape

- Housewares
- Small appliances
- Medical devices
- Rigid medical packaging
- Infant care
- Sports bottles
- Bulk water
- Face protection
- Outdoor signs

The applications featured throughout this brochure show how different markets draw different values from the attributes of Eastman Tritan™ copolyester. *How will Tritan add value to your product?*

Chemical resistance and heat resistance combine for unmatched dishwasher durability in many clear housewares items. Toughness also adds durability and value to items facing repeated dishwasher cycles.



Processability means a choice of injection molding or extrusion blow molding bisphenol A (BPA)-free baby bottles.



Toughness and glasslike clarity provide a lightweight, shatterproof alternative to glass.



Processability may also mean faster cycle times—for outdoor signs—without separate steps for annealing or predrying.



Chemical resistance in medical devices allows the use of common disinfectants and sterilizing techniques while providing greater flexibility with solvent bonding and other secondary operations.



For more details of successful market applications, visit www.eastman.com/tritan.

A collaborative approach to **design freedom.**

Design freedom is an important reason for the success of Eastman Tritan™ copolyester. Tritan opens your mind to shapes, colors, dimensions, thickness, and toughness that weren't possible or practical until now. Eastman has helped designers and engineers discover Tritan at many stages of the go-to-market process—with early involvement often reaping the greatest rewards.

Throughout the process.

The case of the reusable Double Dosing Cup is a blueprint for success attributable to early collaboration between Eastman and DD Studios.

In addition to demonstrating a wide breadth of functional and processing possibilities for Eastman Tritan™ copolyester in the medical marketplace, the Double Dosing Cup is simply a lot of fun. You can see this attractive and engaging prototype come to life at www.innovationlab.eastman.com/innovationlab/inspiration/inspiration_dosing.htm.



In addition to vibrant color and clarity, the Double Dosing Cup demonstrates remarkable toughness, chemical resistance, and assembly by "stiction."

Through thick and thin.

Designers love dramatic shapes. Sometimes they are hard to produce from traditional polymers. Where flow restrictions may prohibit long, thin design elements—or where thickness taxes a polymer’s clarity and processability—grades of Eastman Tritan™ copolyester can turn the improbable into practical.

Eastman has worked with engineers and molders to achieve remarkable clarity in thick parts, providing chemical and impact resistance with wall thicknesses up to 1.81 inches.



Toughness allows reusable water bottles to stand up to everyday abuse—and helps reduce the number of products being thrown away.

Through a kaleidoscope of vibrant colors.

The remarkable clarity of Eastman Tritan™ copolyester enables tintability—helping bring colors to life.

Through sharing innovative ideas.

One of the industry’s strongest voices of collaboration is the Eastman Innovation Lab, where the definition of innovation is “doing things differently . . . doing things better.” Visit Eastman Innovation Lab at www.eastmaninnovationlab.com.



How can Eastman Tritan™ copolyester—and an open mind—open new market opportunities for you?

Confidence

is a key ingredient in Eastman Tritan™ copolyester.

Eastman is a world leader in providing a reliable source of polymer solutions. So Eastman can bring to the table an industry-leading knowledge of copolyesters and other polymers, including molding, processing, market insight, and design capabilities.

From the safe and sustainable production of polymers like Eastman Tritan™ copolyester to reliable supply strategies and proactive safety initiatives in some markets, Eastman takes an active role to earn and retain confidence throughout the value chain.

Surprising opportunities—without surprises.

Eastman Tritan™ copolyester continues to transform thinking about clear polymers with its unique balance of performance and processing attributes.

As a leading developer and manufacturer of innovative polymers, Eastman has established a solid track record for quality, reliable supply, and fair pricing of its brands—even in cases where a proprietary polymer has no competition in the marketplace.

Inherent toughness combines with chemical resistance and heat resistance in reusable bulk water containers that can withstand high-temperature washing systems. A taste-free, odor-free, and BPA-free alternative to PC.

Toughness and clarity combine to deliver greater peace of mind to dialysis patients and caregivers.



Raising the bar for the future.

Consumers have questions about the safety of the products they use—and they should. Eastman takes these questions and concerns seriously. In fact, Eastman has been proactive in some markets where standards have not been set.

Until recently, there were no testing protocols established to assess biocompatibility of polymers used in breast pumps, pacifiers, or similar infant care products. In 2009, Eastman proactively contracted an independent third-party lab to test cytotoxicity, sensitization reactions, and skin irritation response of Eastman Tritan™ copolyester.

The results were so impressive—and reassuring for the marketplace—that Eastman promoted this battery of tests to become the industry standard for all materials in the sensitive infant care market.

Why wait to collaborate?

Involving Eastman and Eastman Tritan™ copolyester early in the process can help avoid false starts and limit manufacturing disruptions. Our technical services expertise can help you to refine your manufacturing, tooling, processing, testing, and secondary operations. Eastman enjoys the trust of some of the industry's foremost innovators. *How can Eastman and Tritan earn your confidence?*

**Don't worry.
It's made with Tritan.**

Toughness and heat resistance not only protect sterile contents of rigid medical packaging—they can allow more rapid accelerated-aging protocol validation and more reliable shelf-life qualification before going to market.

Clarity in face protection markets may combine with toughness and chemical resistance to provide clear advantages in applications where cracks, crazing, and haziness can impair visibility.



Sustainability is a choice.

Eastman Tritan™ copolyester— the sustainable polymer solution.

Eastman Tritan™ copolyester contributes to the sustainability focus of Eastman. Markets have embraced Tritan because it offers many advantages over other materials, including

- Inherent toughness of Tritan increases durability, which can increase product life and reduce waste.
- Tritan can reduce energy use by eliminating steps in processing, such as annealing and predrying extruded sheet.
- It has lower density than polycarbonate, which yields more parts per pound or kilogram of polymer.
- Parts made from Tritan are much lighter than those made of glass, which can reduce shipping energy and costs.
- Tritan has a lower “cradle-to-grave” environmental impact than metal sports bottles—and requires less energy to process.
- Reusable water bottles made from Tritan reduce the flow of single-use bottles to the waste stream.
- In some applications, the toughness of Tritan can allow downgauging to reduce material usage.
- Its toughness offers opportunities to use less protective packaging compared with glass or brittle polymers.
- Tritan is BPA free and made without halogens, sulfur, nitrogen, lead, mercury, cadmium, or hexavalent chromium—so it helps keep these materials out of the waste stream.
- Tritan is GREENGUARD Indoor Air Quality Certified®.

Eastman Chemical Company— the sustainable innovation partner.

For Eastman, sustainability begins with environmental stewardship—but also includes social responsibility and economic growth. Our goal is that two-thirds of new product launches are sustainably advantaged compared with alternative products. What’s more, Eastman has committed to conducting life cycle analyses on all new products.

Eastman expects customers to set high standards for us—and we do the same for our suppliers. We present the Eastman Supplier Excellence Award to encourage suppliers to deliver value-adding products with a focus on sustainability.

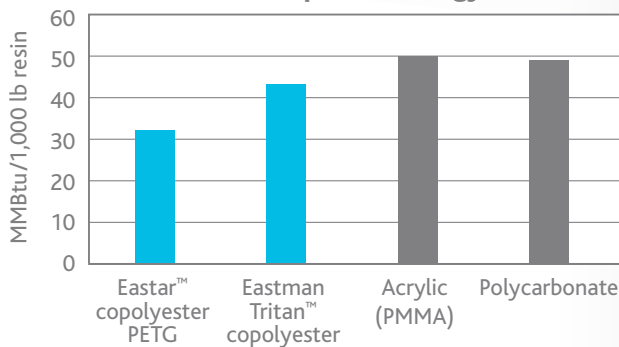
Sustainable progress.

- Eastman won the 2009 Presidential Green Chemistry Challenge Award for its “gentler” green biocatalytic process. It consumes less energy, uses no solvents, and virtually eliminates by-products.
- In September 2009, *Newsweek* magazine ranked Eastman as one of its top 100 Greenest Companies in America (No. 95 of the 500 Greenest Companies in America). The *Newsweek Green Rankings* is the first-ever report based on companies’ actual environmental performance, policies, and reputation.
- Eastman has made great strides in reducing our environmental footprint, including
 - Reduced GHG intensity 25% (1998–2008)
 - Reduced energy intensity 35% (1998–2008)
 - Reduced volatile organic compounds (VOC) emissions 34% (2005–2008)
- Eastman was recognized by The Global Green 100 List for 2009 by Uptime Institute.

Sustainable innovation through the marriage of durable aesthetics and functionality.

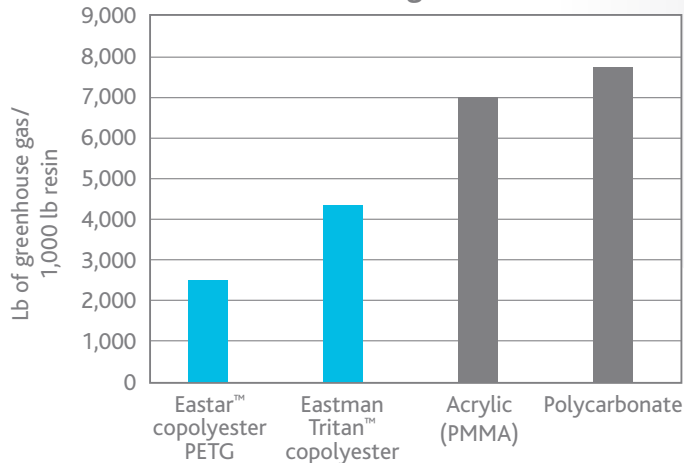
- For every 1 million pounds (453,592 kilograms) of Eastman Tritan™ copolyester used in place of polycarbonate, the energy saved is equal to 140,000 gallons (530,000 liters) of gasoline.
- The decrease in greenhouse gas emissions for using 1 million pounds of Eastman Tritan™ copolyester over polycarbonate is equivalent to taking 390 cars off the street for a year.
- The excellent thermal stability of Eastman Tritan™ copolyester permits the complete reuse of all clean, dry regrind in the recycling process.

"Cradle-to-pellet" energy data



Eastman takes pride in making products that offer our customers innovative solutions and are safe for the environment. *How can Eastman help achieve your sustainability goals?*

Greenhouse gas emissions



For more details on sustainability commitments and updates, visit www.eastman.com.

■ Preliminary LCA, conducted by Franklin Associates, Ltd. (comprehensive assessment underway)
 ■ Plastics Europe LCA

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Safety Data Sheets providing safety precautions that should be observed when handling and storing Eastman products are available online or by request. You should obtain and review the available material safety information before handling any of these products. If any materials mentioned are not Eastman products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed.

It is the responsibility of the medical device manufacturer ("Manufacturer") to determine the suitability of all component parts and raw materials, including any Eastman product, used in its final product to ensure safety and compliance with requirements of the United States Food and Drug Administration (FDA) or other international regulatory agencies.

Eastman products have not been designed for nor are they promoted for end uses that would be categorized either by the United States FDA or by the International Standards Organization (ISO) as implant devices. Eastman products are not intended for use in the following applications: (1) in any bodily implant applications for greater than 30 days, based on FDA-Modified ISO-10993, Part 1, "Biological Evaluation of Medical Devices" tests (including any cosmetic, reconstructive, or reproductive implant applications); (2) in any cardiac prosthetic device application, regardless of the length of time involved, including, without limitation, pacemaker leads and devices, artificial hearts, heart valves, intra-aortic balloons and control systems, and ventricular bypass assisted devices; or (3) as any critical component in any medical device that supports or sustains human life.

For manufacturers of medical devices, biological evaluation of medical devices is performed to determine the potential toxicity resulting from contact of the component materials of the device with the body. The ranges of tests under FDA-Modified ISO-10993, Part 1, "Biological Evaluation of Medical Devices" include cytotoxicity, sensitization, irritation or intracutaneous reactivity, systemic toxicity (acute), subchronic toxicity (subacute), implantation, and hemocompatibility. For Eastman products offered for the medical market, limited testing information is available on request. The Manufacturer of the medical device is responsible for the biological evaluation of the finished medical device.

The suitability of an Eastman product in a given end-use environment is dependent on various conditions including, without limitation, chemical compatibility, temperature, part design, sterilization method, residual stresses, and external loads. It is the responsibility of the Manufacturer to evaluate its final product under actual end-use requirements and to adequately advise and warn purchasers and users thereof.

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