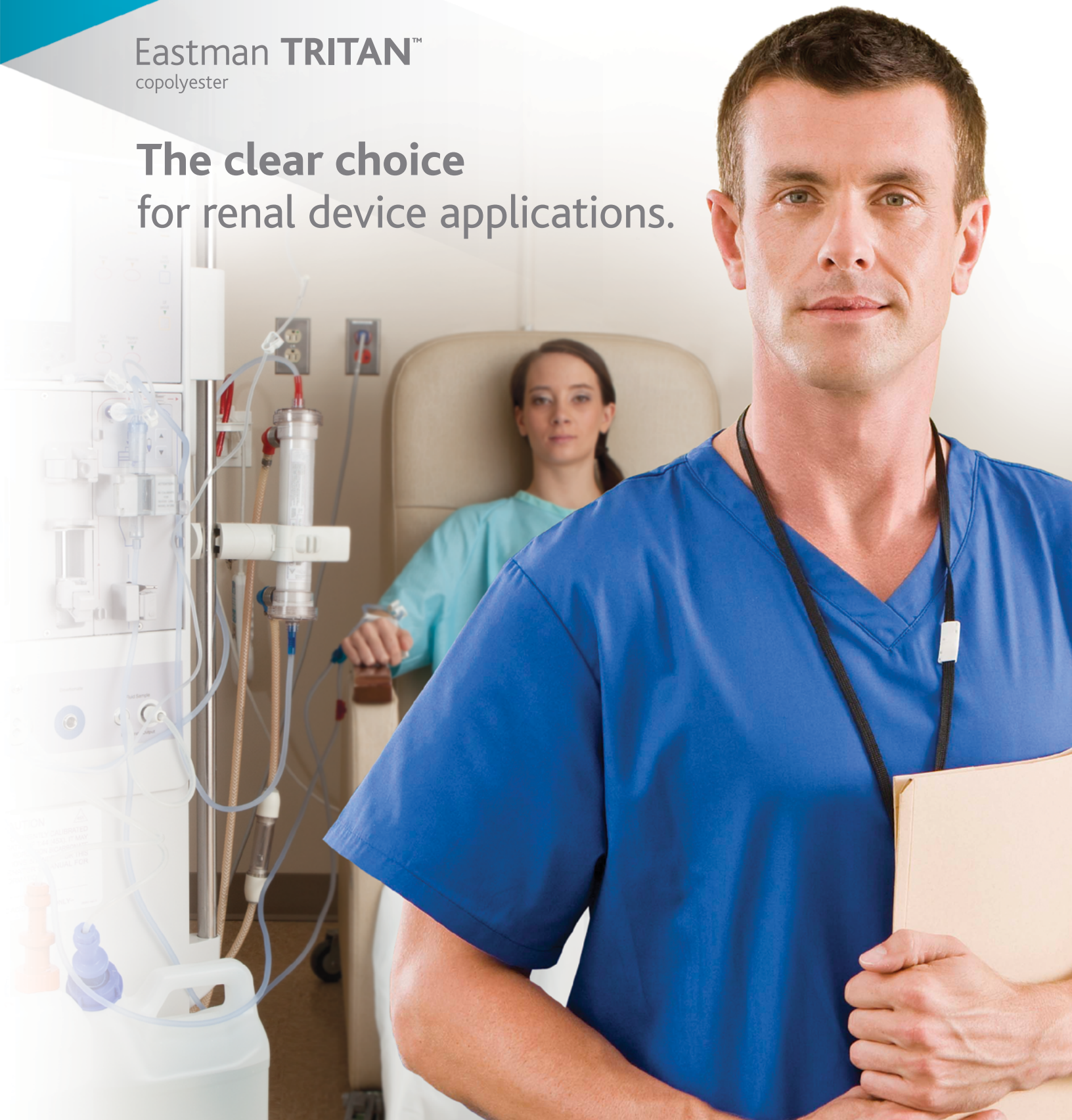
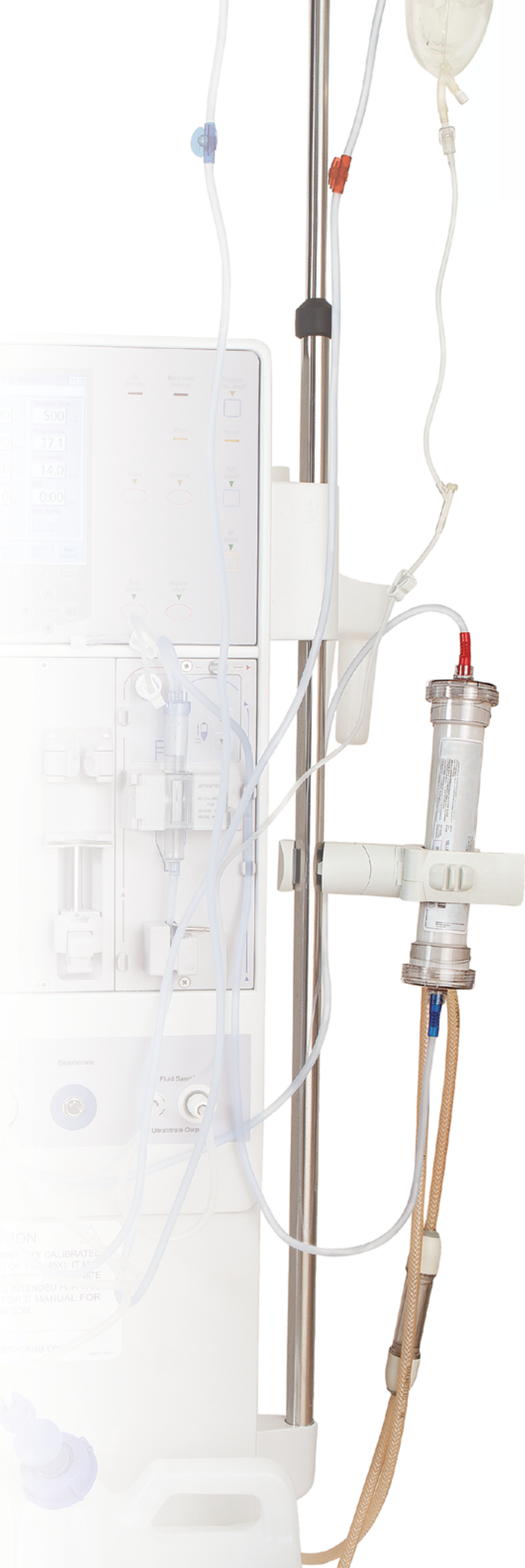


EASTMAN

Eastman **TRITAN™**
copolyester

The clear choice
for renal device applications.





What you **see.**

Premature cracking and breakage in renal device housings not only present an economic challenge for hospitals, clinics, and device manufacturers—they also present confidence and safety concerns for patients.

The glasslike clarity and toughness of Eastman Tritan™ copolyester provide quality and peace of mind for health care professionals and patients. With housings made from Tritan:

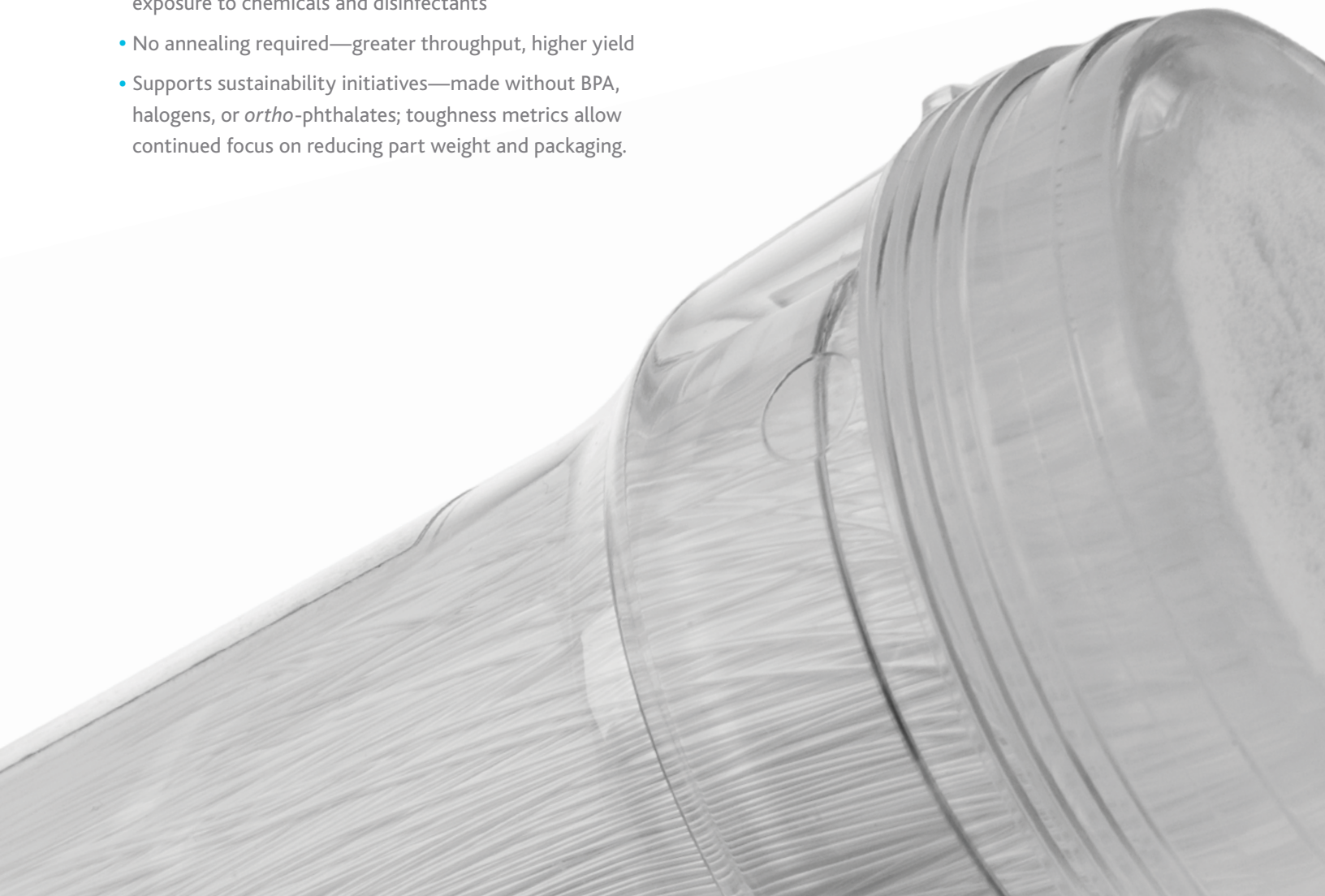
- Nurses see membranes more clearly with greater confidence in detecting air bubbles or blood leakage during treatment.
- Patients and family members see a clear, lifesaving device.
- Everyone sees the benefits of clarity, color, and functional integrity that are not compromised after sterilization by gamma or e-beam radiation.

You'll like what you
see and get with Tritan.

What you **get.**

Eastman Tritan™ copolyester is an innovative, next-generation polymer that offers a balance of processing and performance advantages over other engineering thermoplastics and polyolefins—for added value, greater hospital and clinic confidence, and reduced system costs.

- Outstanding clarity—before and after gamma and e-beam sterilization
- Exceptional toughness and durability— housings made with Tritan are capable of protecting hollow fiber membranes.
- Excellent chemical resistance—maintains part integrity on exposure to chemicals and disinfectants
- No annealing required—greater throughput, higher yield
- Supports sustainability initiatives—made without BPA, halogens, or *ortho*-phthalates; toughness metrics allow continued focus on reducing part weight and packaging.



It's tough to beat. That's easy to see.

Devices used in acute or chronic renal therapy (including hemodialyzers, hemoconcentrators, and hemofilter housings) are often compromised by:

- Shipping damage
- Tapping to remove air
- Dropping the device
- Haziness or opacity from post-sterilization color and clarity shift
- Aggressive chemical disinfectants commonly used in renal treatment environments

Eastman Tritan™ copolyester provides tough and clear materials that offer enhanced environmental stress cracking (ESC) resistance, which helps reduce premature cracking and breakage. You'll quickly see that Tritan can deliver many processing and performance benefits—plus reduced system costs.

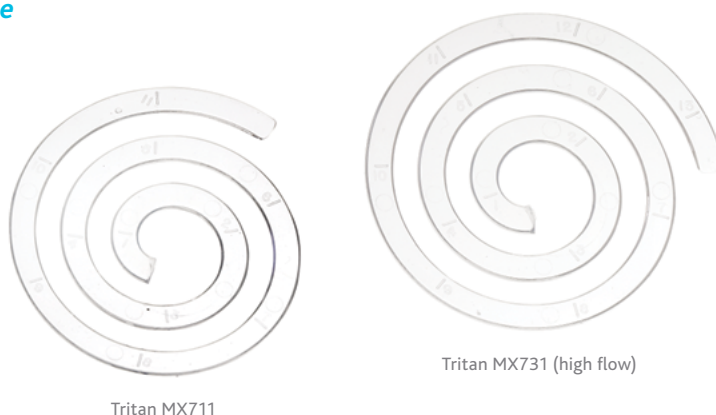
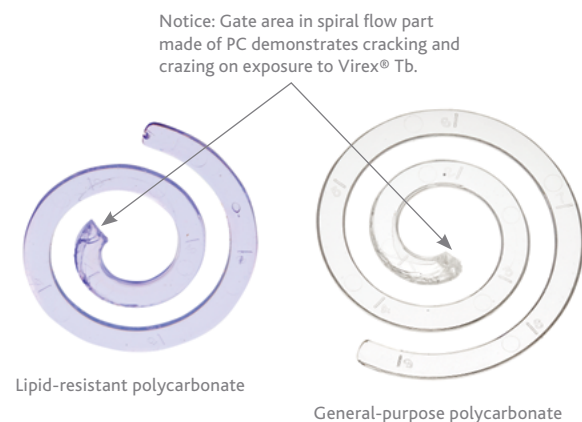
Clearly exceptional chemical resistance

Housings molded from Tritan offer outstanding resistance to lipids, Renalin® sterilant, and a wide range of disinfectants. The improved chemical resistance of Tritan also means improved ESC resistance during solvent bonding and other secondary operations.

The following spiral-flow pictures highlight the combination of chemical resistance and good flow properties. All test spirals were dipped in Virex® Tb, a common medical disinfectant, demonstrating residual stress can cause cracking in molded parts on exposure to chemicals and disinfectants.

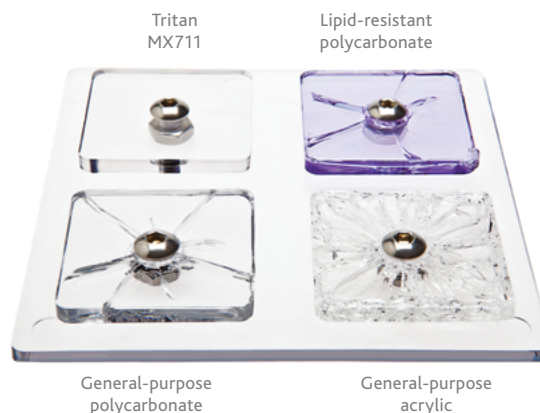
Comparisons of flowability and chemical resistance

Notice: The medical grade polycarbonate flow length (linear distance in spiral flow part) is significantly less than Tritan resin flow length.



Chemical resistance with externally applied stress

The photo on the right demonstrates the excellent ESC resistance of Tritan. An external stress was applied to the plaques pictured, and then each plaque was exposed to Virex® Tb. Tritan resists craze and crack initiation and propagation, maintaining the physical integrity of the injection molded part.



Outstanding impact strength and toughness

Eastman Tritan™ copolyester compares favorably with polycarbonate (PC) for both major toughness metrics—and offers significantly greater impact strength than other common thermoplastics (acrylics, styrenics, copolymers thereof, and polyolefins).

Retains clarity, color, and strength after sterilization

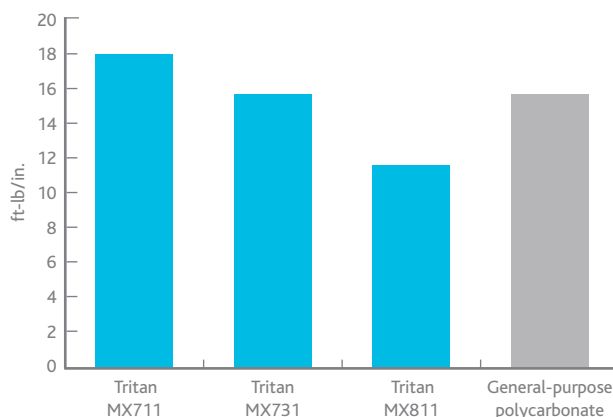
Compared with polymers that shift color significantly after sterilization—or become opaque and hazy—Tritan provides superior color and clarity retention. See the following photo for an actual comparison of Tritan with lipid-resistant polycarbonate and general-purpose polycarbonate after sterilization.

Tough to beat for processability

Tritan processes similarly to PC but with less risk of black speck formation—and without requiring an annealing step.

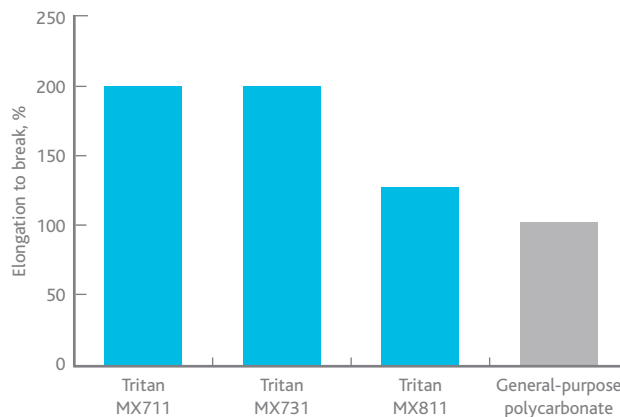
The low residual stress, combined with outstanding chemical resistance of Tritan, lowers system costs by allowing greater secondary operation flexibility and yield.

Notched Izod impact* (compared with PC)



*Izod impact strength, notched @ 23°C (73°F) ASTM D256

Elongation to break* (compared with PC)



*Tensile elongation to break @ 23°C (73°F) ASTM D638

Color shift during sterilization

Less color shift—better aesthetics and patient confidence



Tritan shows minimal color shift and returns to original color in 14 days. Acrylic and PC have significant color shifts after exposure to gamma radiation.

Clearing up concerns about sustainability.

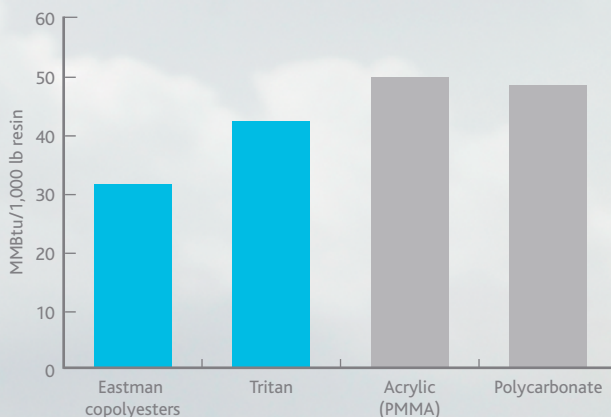
Eastman understands many brand owners and manufacturers of renal devices are working toward sustainability goals—for the good of their brand image and business.

Eastman Tritan™ copolyester provides a material that can be molded into housings with a world of sustainability advantages.

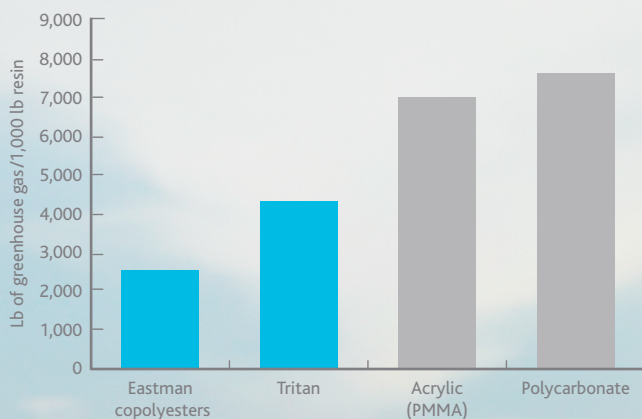
- Toughness allows continued focus on designing housings with thinner walls.
- Durability allows the potential for less packaging.
- Free of BPA, halogens, and *ortho*-phthalates
- Free of chlorine—reduces potential generation of hazardous pollutants during incineration



Cradle-to-pellet energy data



Greenhouse gas emissions



■ Comprehensive LCI, conducted by Franklin Associates, Ltd.
■ Plastics Europe

Less is definitely more. Using Tritan definitely offers you more ways to enhance your company's "green" image.

Helping you shape **what's next.**

Eastman Chemical Company has a tradition of innovation. For more than 70 years, Eastman has been helping customers develop innovative products—then bring them to market efficiently.

Today, as always, Eastman is committed to the long-term needs of the medical industry. Eastman is a reliable supplier of technical support and a robust portfolio of Eastman medical polymers for medical devices and rigid medical packaging.

Eastman is always prepared to leverage its industry understanding, design capability, and engineering and manufacturing expertise to help customers shape what's next.



For more information about Eastman Tritan™ copolyester and how Eastman can help you find the best solutions for your renal treatment device needs, visit www.eastman.com/medical or call 1-800-EASTMAN (1-800-327-8626).



The results of insight™

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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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