EASTMAN

Eastman **EASTALITE**™
copolyester

Safety and sustainability in one package

Styrene-free. **Opportunity-rich.**

Eastman Eastalite™ copolyester is a sustainable alternative to high-impact polystyrene (HIPS) used for opaque rigid medical packaging. Eastalite can reduce safety and sustainability concerns related to HIPS while offering opportunities to improve performance and lower processing costs.

This new foamed copolyester resin fills the unmet need for a styrene-free packaging material that is comparable in price to HIPS. Eastman Eastalite™ copolyester is available as a sheet that consists of a foam core between skins of Eastar™ copolyester 6763. Unlike HIPS, products made from Eastalite can be processed with minimal generation of particulates and angel hair—and reduced risk of black specks. Eastalite also can offer performance advantages over HIPS and other opaque materials in applications where there are concerns about fumes emitted during processing.

Eastalite is ideal for a variety of medical applications, including rigid medical packaging.

Eastman Eastalite™ copolyester is a styrene-free alternative to HIPS and other opaque rigid medical packaging materials. It is made without other materials of concern, including: butadiene, BPA and bisphenol S (BPS), *ortho*-phthalates, PVC, or halogens, such as chlorine or bromine.

- Eastalite complies with select ISO 10993 requirements for biocompatibility of medical devices.
- Eastalite also is compliant with applicable sections of ISO 11607.
- Packaging made with Eastalite foamed copolyester retains color stability and functional integrity following sterilization using a variety of methods, including ethylene oxide (EtO), gamma or e-beam irradiation, or gas plasma. Packaging made with HIPS can discolor following irradiation.

Extending the portfolio of Eastman™ medical polymers

Eastman Chemical Company has supplied a wide range of materials for the medical market for more than 70 years. Eastman is a reliable supplier of advanced medical grade polymers for devices and packaging.

Opaque Eastman Eastalite™ copolyester joins crystal-clear Eastar™ copolyester 6763 and Eastman Tritan™ copolyester to provide the industry with reliable solutions for a full spectrum of protective and functional rigid medical packaging.

Eastalite can reduce safety and sustainability concerns related to HIPS.

Opportunity is at the core
of Eastman Eastalite™ copolyester.

Eastman Eastalite™ copolyester is the core layer between surfaces of proven and trusted Eastar™ copolyester 6763. Each surface of Eastar 6763 ensures excellent and consistent seal integrity as well as several processing and performance advantages:

- It can be cut with minimal generation of particulates and angel hair—further ensuring the seal won't be compromised by contamination.
- It can be processed with the same thermoforming, sealing, and extrusion equipment as Eastar 6763 or HIPS.
- It is ideal for a variety of medical applications, including:
  - Rigid medical packaging for medical devices
  - Thermoformed pharmaceutical packaging
  - Medical kits
  - Work-in-process trays
  - Mounting cards

Strength at every turn

Packaging made with Eastman Eastalite™ copolyester offers greater tear strength than the more brittle and crack-susceptible HIPS—so parts can be designed with deep undercuts and durability.

ASTM D1004 tear resistance
(40 mil MD Tear Energy [N*mm])

Material	Specific gravity	Tear resistance
Eastalite MP010F	0.9	164
Eastalite MP007F	0.75	113
Eastalite MP006F	0.6	96
HIPS (monolayer)	1.03	81

Eastman Eastalite™ copolyester also offers better flex strength than HIPS, resulting in better hinge life and less stress whitening.

180-degree flex cycles on Eastman card flex machine
(non-ASTM test) (maximum cycles to failure)

Eastalite MP007F	Unknown (>50)
HIPS	<15

Opportunities at every level

The unique combination of properties of Eastman Eastalite™ copolyester offers opportunities in opaque rigid medical packaging in a variety of ways:

Opportunities for design flexibility

- Allows deep undercuts that are not practical with HIPS
- Provides flex resistance and durability
- Makes processing easier and faster
- Allows easy printability

Opportunities for cost savings

- Eastalite is competitive with HIPS on a surface area (MSI) basis, but overall process cost may be lower because it can:
  - Reduce the need to sharpen trim blades
  - Reduce material waste resulting from the brittleness of HIPS
  - Reduce waste related to black speck with HIPS
  - Reduce the need for cleaning particulates
  - Reduce the need for inspection
  - Be thermoformed at a lower temperature that can decrease cycle time

Opportunities for sustainable innovation

- Market opaque products that satisfy a growing need for safe, sustainable, and lightweight rigid medical packaging
- Advance market share by offering products that satisfy more stringent Environmentally Preferable Purchasing (EPP) guidelines

Made without styrene, BPA, *ortho*-phthalates, or other materials of concern

Our commitment to sustainability
is more than skin-deep.

Eastman's continued commitment to sustainability is minimizing our environmental footprint and conserving natural resources. Sustainability is integrated into every area of our business—for the benefit of our customers, our shareholders, our employees, and the world at large.

Eastman Eastalite™ copolyester is a good example of this commitment in action, because it supports EPP guidelines and initiatives such as:

- Lightweighting—Eastalite can reduce transportation energy requirements by reducing packaging weight and source material.
- Material Safety—Eastalite is made without styrene and other materials of concern that are found in HIPS and other packaging materials.

Sustainability requires commitment at every level.

Eastman is committed to protecting sustainability through the continuous improvement of our energy performance, reduction of waste and greenhouse gases, and improvement of water and air quality. Eastman has been widely recognized for these efforts:

- Newsweek has named Eastman one of the "500 Greenest Companies in America" four years in a row. The annual Newsweek Green Ranking is the only ranking of its kind based on companies' actual environmental performance, policies, and reputation.
- The U.S. Environmental Protection Agency named Eastman a 2012 ENERGY STAR® Partner of the Year for strategically managing and improving energy efficiency and a 2013 ENERGY STAR Partner of the Year for continuing to build on its sound energy foundation. Eastman is the only chemical company to achieve this distinction two years in a row.
- American Chemistry Council named Eastman the 2013 Responsible Care® company of the year.

Eastman is committed to Life Cycle Assessments (LCAs).

In today's world, sustainability is a major driver for key business decisions. Because of this, Eastman is mindful of the need to substantiate its sustainability assertions. That's why the company is collaborating with its major customers to conduct LCAs to better understand how it can improve the overall sustainability of its products and, in turn, help customers meet their sustainability goals.

LCAs that involve the value chain provide holistic evaluations of products' entire productive life, from raw material sourcing and manufacturing processes through distribution, usage, and disposal. Eastman has conducted LCAs on the cradle-to-gate portion of the value chain for many of its products, including Eastman Eastalite™ copolyester.

To learn more about the steps Eastman is taking to connect science and sustainability—visit www.eastman.com/sustainability.

For more information about Eastman Eastalite™ copolyester and other Eastman medical polymers, visit www.eastman.com/medical or call 1-800-EASTMAN (800-327-8626).

EASTMAN

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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