

# The right plastic. Now.

Specialty polymers and compounds for demanding markets



**EASTMAN**

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## EASTMAN SPECIALTY PLASTICS

	MARKET								PROCESS	
	Automotive	Durables	Electronics	Electronic Films	Medical	Packaging	Retail and Architecture	3D Printing	Molding	Extruding
Amphora								•		
Cadence							•			•
DuraStar		•			•		•		•	
Eastalite					•					•
Eastar		•			•	•	•		•	•
Ecdel					•				•	•
Embrace						•				•
The Glass Polymer						•			•	
Eastman MXF221					•				•	•
Provista							•			•
Spectar							•			•
Tenite		•	•		•	•	•		•	•
Trêva	•	•	•			•			•	•
Tritan		•	•		•	•	•		•	•
Tritan HM	•	•	•						•	
Visualize				•						•

# The next big thing starts today.

The status quo is never static. Brands and product designers can seldom rest on their laurels as they are constantly challenged to come up with the next innovation.

As consumers demand that their next purchases be durable, wearable, shareable, affordable, fashionable, sustainable—and a long list of other “ables”—the key is to start with the most capable materials.

At Eastman, we leverage material expertise and extraordinary market insight to manufacture the specialty plastics that brands, engineers, and consumers trust to do the job. We design, develop, and produce the designer polymers and compounds used in everyday and extraordinary products alike.

In fact, we offer the world's largest portfolio of thermoplastic polyester materials, exhibiting the gamut of thermal, mechanical, and rheological properties. As such, product designers can meet market demands for toughness, clarity, color, flexibility, flow, and chemical resistance.



## Processing possibilities

- Blown film
- Composite technology
- Extrusion blow molding
- Extrusion profiles and sheet
- Injection blow molding
- Injection molding
- Injection stretch blow molding
- Insert molding
- Lamination
- Nonwoven melt blown
- Nonwoven spunbound
- Powder coating
- Profile extrusion
- Rotational molding
- Thermoforming
- Vacuum forming





# Eastman AMPHORA™

3D polymer

## The low-odor, styrene-free option

Eastman Amphora™ 3D polymer is a low-odor, styrene-free choice that is uniquely suited for 3D printing applications. With Amphora, makers can create items that are more functional, durable, efficient, and attractive.

Amphora also complies with certain FDA regulations for food contact applications. That means, with Amphora, you'll be able to make lots of things you can't with other materials. Best of all, you'll be able to make certain your final product meets your expectations.

### Key characteristics

- Clarity and gloss
- Low odor
- Dimensional stability
- Excellent toughness and temperature resistance
- Ease of processing
- FDA compliance
- Reliability
- Enhanced aesthetics
- Property retention in 3D applications
- Styrene free
- Workability

### Major applications

- 3D printing



## Worry-free durability for furniture laminates

Eastman Cadence™ resins for calendered films are developed to meet the demand for environmentally responsible materials and the challenges of innovative decorating for the calendering industry. Tough, durable, and environmentally friendly, these materials easily take on the most demanding shapes and forms. With Cadence resins, it's easy to decorate using offset lithographic, flexographic, and screen-printing processes.

### Key characteristics

- Ease of processing
- High melt strength
- Thermal stability
- Halogen free
- Noncrystallizing
- Wide calendering and thermoforming windows
- Good low-temperature toughness

### Major applications

- Appliance films
- Architectural laminates
- Automotive films
- Decorative laminates
- Furniture/furniture trim
- Transaction cards



## Excellent aesthetics and functionality

Ideally suited for injection molded applications, DuraStar™ polymers have proven to be incredibly versatile and brilliantly clear polymers that deliver strength, chemical resistance, dimensional stability, low shrinkage rates, and other enhanced property advantages.

DuraStar is used in a wide range of applications, including appliances, consumer goods, and toys.

### Key characteristics

- Outstanding impact resistance
- Exceptional clarity
- Good chemical resistance
- High gloss
- Not manufactured with BPA, BPS, or plasticizers
- Contains a mold release
- Fast drying times
- Ultraviolet light stabilization package

### Major applications

#### **Durables**

- Appliance parts
- Floor care
- Furniture/furniture trim
- Toys/sporting goods
- Housewares
- In-mold decoration

#### **Retail and Architecture**

- Displays and fixtures
- Store displays

#### **Medical**

- Medical devices



Eastman **EASTALITE™**  
copolyester

## A safe and sustainable choice

Eastman Eastalite™ copolyester is a safe and sustainable alternative to high-impact polystyrene (HIPS). This new opaque rigid medical packaging fills the unmet need for a styrene-free packaging material that is comparable in price to HIPS.

Eastalite can be processed with minimal generation of particulates and angel hair—and reduced risk of black specks.

### Key characteristics

- Color stability and functional integrity following sterilization
- Limited compatibility in the recycling stream
- Cleaner cutting than HIPS
- Lightweighting opportunities
- Better hinge life
- Faster processing
- Reduced material waste
- Styrene-free alternative with no butadiene, BPA, BPS, PVC, halogens, or *ortho*-phthalates

### Major applications

- Rigid medical packaging
- Thermoformed pharmaceutical packaging
- Medical kits
- Work-in-process trays
- Mounting cards





## A long-time favorite that's still light-years ahead

Eastar™ copolyesters offer a unique combination of properties—aesthetics, chemical resistance, performance reliability, and economics—that gives manufacturers what they need to successfully compete in today's marketplace. Eastar has a long tradition as the material of choice in the medical industry, matching various biological, regulatory, sterilization, and disposal requirements.

### Key characteristics

- Exceptional clarity
- Good impact strength and toughness
- Chemical resistance, including from IPA and lipids
- High gloss
- Exceptional colorability
- Complies with U.S. Food and Drug Administration (FDA) and Japanese (JHOSPA) requirements for use in specified food contact applications
- GREENGUARD Indoor Air Quality Certified®
- Not manufactured with BPA, BPS, or plasticizers
- Exceptional color stability after gamma and e-beam sterilization
- Ductility and flexibility, allowing snap-fit assembly to eliminate costly solvent bonding
- Swageability
- Processability in complex part designs
- Exceptional thermoformability and sealability







## Major applications

### Durables

- Pen caps
- Toothbrushes
- Oral hygiene
- Cards
- Laminating
- Stock bottles
- Water filtration

### Packaging

- Food packaging
- Cosmetics packaging
- Personal care packaging
- Fragrance containers
- Oral hygiene
- Cosmetics jars and caps
- Beverage containers
- Handle containers
- Industrial packaging

### Retail and Architecture

- Displays and fixtures

### Medical

- Medical device components
- Medical packaging
- Suction and drainage
- Labware
- Surgical instruments
- Fluid administration
- Blood contact devices
- Syringe components
- Pump housings
- Disposable labware



## Plasticizer-free copolyester

EcDEL™ elastomers can be injection molded, extrusion blow molded, and extruded into film or sheet as well as fabricated into bags.

They are ideal for applications in flexible medical or pharmaceutical packaging and tubing where low extractables, toughness, flex-crack resistance, high-creep resistance, and utility in harsh environments are required.

### Key characteristics

- High flexibility and toughness without the use of modifiers
- Free of *ortho*-phthalate plasticizers
- Very high clarity without blushing
- Excellent puncture resistance
- Low-temperature strength
- Low extractables
- Outstanding flex-crack and creep resistance
- Temperature resistance (autoclavable, dimensionally stable, low shrink)
- Enables excellent sealing in multilayer films
- Meets selected USP Class VI/ISO 10993 testing requirements
- Solvent, RF, laser, and impulse bondable

### Major applications

- Bags
- Flexible medical packaging
- IV containers
- Pharmaceutical packaging
- Tubing
- Films





Eastman **EMBRACE™**  
family of resins

## Shrink film for greater shelf appeal

The Eastman Embrace™ family of resins can help make a big difference where it counts—on the shelf. Simply put, shrink sells. With up to 75% shrinkage, toughness, clarity, and printability, brand owners can enhance brand experiences through superb aesthetics.

Embrace offers the flexibility to design bold, glossy 360° label graphics wrapped around high-contoured or complex containers.

### Key characteristics

- Excellent printability
- Greater than 75% ultimate shrinkage
- Crystal clarity and gloss
- Shrinks to fit high-contour bottles
- Good chemical resistance
- UV protection with Embrace HY
- Eye-catching 360° graphic capability

### Major applications

- Shrink labels
- Beverage packaging
- Food packaging
- Personal care packaging
- Household packaging





# THE GLASS POLYMER™

family of cosmetic materials

## Creating astonishing good looks

The Glass Polymer™ family of cosmetic materials has a broad portfolio that delivers the design freedom and processing flexibility to create luxury packaging that reflects the quality and content of the product inside and has extraordinary shelf appeal. That's why many of the world's leading brands and top manufacturers prefer The Glass Polymer.

From mass market to prestige products, The Glass Polymer offers durability, glasslike clarity, and chemical resistance with a luxurious feel.

### Key characteristics

- Luxurious look and feel
- Superb chemical resistance
- Ease of secondary processes: color, decoration, hot stamping
- Durable, tough, and shatter resistant
- Ability to mold thick parts

### Major applications

- Cosmetics packaging
- Custom containers
- Skin care jars
- Fragrance caps
- Color cosmetics packaging



# Eastman MXF221

copolyester

## Increase the life expectancy of your medical devices.

As a fully compounded polymer, Eastman MXF221 copolyester offers superior chemical resistance, ensuring durability and impact strength for medical device housings and hardware.

Complying with hospital Environmentally Preferable Purchasing (EPP) guidelines, Eastman MXF221 copolyester is a medical grade polymer that provides excellent chemical resistance and is not manufactured with substances containing halogens. Ideal for electronic device housings, it can withstand many aggressive disinfectants without cracking, crazing, or hazing.

As a fully compounded polymer, Eastman MXF221 offers the chemical resistance and durability to stand up to the daily rigors of hospital life.

In testing that measures notched Izod impact strength, Eastman MXF221 retained more than 90% of its original impact strength after exposure to stringent disinfectants—far superior to commonly used materials such as polycarbonate blends.

### Key characteristics

- Unsurpassed chemical resistance to harsh disinfectants
- Superior impact strength—even after disinfection
- Product longevity
- Clear or opaque parts
- Uniform color matching
- A fully compounded one-pellet solution
- Biocompatibility
- UL 94 FR V-2 flame retardance

### Major applications

- Electronic medical device housings, enclosures, and covers



## Extrusion of tubes and profiles

Eastman Provista™ copolymer is specifically developed for extrusion into profiles where aesthetics, such as high clarity and gloss coupled with design flexibility, drive demand. Compared to commonly used materials, Provista copolymer can often run on standard processing equipment at increased speeds. Extremely high melt strength makes the resin an excellent choice when extruding profiles into complicated shapes.

### Key characteristics

- Sparkling clarity and high gloss
- Ease of processing
- Excellent chemical resistance
- Complies with FDA and JHOSPA requirements for use in specified food contact applications
- Toughness with flexibility

### Major applications

- Pricing channels
- Rails
- Tubing
- Point-of-purchase displays





Eastman **SPECTAR™**  
copolyester

## Inspired design and effortless fabrication

Eastman Spectar™ copolyester is a premier product for creating durable, sustainable, and flexible interior finish and architectural applications, in-store fixtures, and point-of-purchase displays. Spectar is a powerful tool for enhancing existing products—or creating dramatic new solutions. It is the material of choice for distinctive displays at a lower overall cost.

### Key characteristics

- Crystal clear
- Excellent thermoforming characteristics
- Flexibility for innovative designs
- Outstanding impact resistance
- Outstanding toughness allows downgauging
- Resists chipping and cracking
- GREENGUARD Indoor Air Quality Certified®
- MBDC Cradle to Cradle™ Silver certification

### Major applications

- Displays and fixtures
- Indoor signs
- Point-of-purchase displays
- Shelving systems
- Lighting diffusers
- Skylights
- Decorative walls and panels
- Wall protection, handrails, and corner guards
- Decorative laminates



# Exceptional performance since 1929

Derived from renewable wood cellulose, Tenite™ cellulosics have been used for more than 50 years in a variety of extruded and injection molded applications. Cellulosic plastic is generally selected for its excellent balance of properties: toughness, hardness, strength, surface gloss, clarity, and warm feel. This unique material is manufactured using natural, renewable softwood materials with significantly less petroleum-derived raw materials than traditional plastics.

This enables a viable and attractive alternative to polycarbonate and opens a world of exciting possibilities.

## Key characteristics

- Derived from 100% renewable softwood material
- Contains more than 40% renewable content
- Tough and durable—designed to last
- Feels like wood—warm to touch
- Sounds like wood—dull sound
- Exhibits exceptional clarity
- Excellent chemical resistance
- Molds and extrudes easily
- Colorable—color concentrates available
- Can be scented
- Available in a variety of formulas, plasticizer levels, and additives

## Major applications

### Durables

- Ophthalmics
- Automotive and furniture trim
- Displays
- Tool handles
- Toys and sporting goods
- Office supplies
- Food containers
- Oral care

### Packaging

- Cosmetics

### Retail and Architecture

- Profiles
- Pricing channels
- Tubes

### Medical Devices

- Film and tubing
- Drug delivery and medical devices
- IV components
- Surgical instruments
- Cannulas and connectors



## Naturally. Better.

Eastman Trēva™ engineering bioplastic is a cellulose-based plastic that offers higher performance than other bioplastics, lower environmental impact than other engineering resins, and better dimensional stability than other cellulose. Sourced from sustainably managed forests, Trēva has superior chemical resistance, dimensionally stability, and low birefringence.

Trēva's superior chemical resistance and dimensional stability help create products that are both durable and functional. Also, its excellent flow characteristics empower molders and designers to create intricate, thin-walled parts.

The United States Department of Agriculture's (USDA's) BioPreferred® program has certified Trēva GC6021 with a biobased content of 42% and Trēva GC6011 with a biobased content of 45%.

### Key characteristics

- BPA free
- Dimensional stability
- Excellent chemical resistance
- Excellent flow
- Good clarity
- Low birefringence
- Easy to polish and paint
- Warm touch and feel

### Major applications

- Ophthalmics
- Cosmetics
- Electronic display applications (lenses and covers)
- Electronics and housings
- Wearable devices and headphones





Eastman **TRITAN™**  
copolyester

## The standard in chemical resistance and durability

Eastman Tritan™ copolyester is BPA free. It offers the kind of chemical and heat resistance and durability required for use in dishwashers. This enables a viable and attractive alternative to polycarbonate and opens a world of exciting possibilities.

Tritan is an innovative, clear medical grade polymer that delivers a unique balance of design, processing, and physical properties. It provides outstanding lipid and chemical resistance and is free of all bisphenols (BPA and BPS) and halogens. It also offers greater toughness, heat resistance, and processability than heritage polymers.

### Key characteristics

- Toughness
- Heat resistance
- Chemical resistance
- BPA and BPS free
- Excellent clarity and gloss
- Ease of processing—wide thermoforming window
- Endocrine activity (EA) free
- Shatter and scratch resistant
- Excellent hydrolytic stability
- Compatibility with sterilization methods such as gamma irradiation, e-beam irradiation, and ethylene oxide (EtO) gas



## Major applications

### Durables

- Small and large appliance parts
- Sporting goods
- Reusable water bottles
- Commercial and consumer housewares
- Food storage containers
- Transaction cards
- Infant care
- Large-volume water containers
- In-mold decoration
- Water filtration

### Packaging

- Rigid medical packaging
- Cosmetics

### Medical

- Electronic medical device housings
- Blood contact and nonimplantable medical devices
- IV components
- Rigid medical packaging
- Single-use bioprocessing equipment
- Minimal invasive surgical devices
- Drug delivery devices
- Fluid and respiratory canisters



# Eastman **TRITAN™** HM

glass fiber reinforced copolyester

## A new model for modulus

Designers, molders, and brands looking for greater dimensional stability in their products have a new alternative to glass, metal, polycarbonate, and other plastics. Eastman Tritan™ HM glass fiber reinforced copolyester is a high-modulus material that offers greater stiffness, excellent chemical resistance, BPA-free manufacture, and sound-damping qualities.

With the addition of glass fibers, Tritan HM is an engineered polymer that enables designers to create durable products with thinner, lighter parts—or to easily mold plastic parts that used to require the strength of more expensive metals.

### Key characteristics

- Contact clarity
- Ease of processing
- Excellent hydrolytic stability
- Good chemical resistance
- Good heat resistance
- Good toughness
- Increased modulus or stiffness

### Major applications

- Appliances
- Automotive applications
- Electronics



### What can you make with a glass fiber reinforced copolyester?

If you have an idea, we would like to help you develop it! We love working with pioneering brands. For innovation stories about Eastman products, visit [www.eastmaninnovationlab.com](http://www.eastmaninnovationlab.com).



## Displaying innovation—displaying confidence

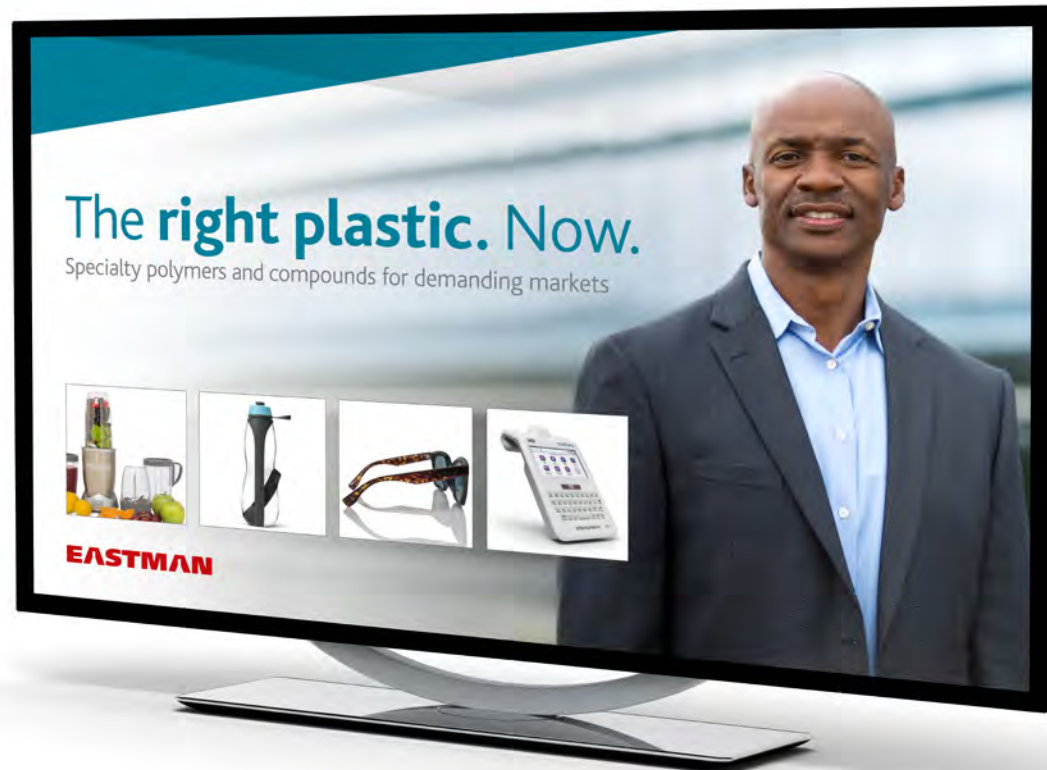
We live in a world increasingly connected by technology that uses electronic displays to manage, monitor, consume, and disseminate information. As consumer expectations rise, brands are constantly challenged to improve resolution, contrast, color accuracy, and brightness, all while making ever thinner and more attractive devices. Eastman enables these brilliant new displays by creating new polymers to precisely tune the optical performance of polarizer films.

### Key characteristics

- Delivering greater optical clarity for high resolution and contrast ratios
- Customized retardation and refractive index properties
- Reduced light leakage and more accurate colors—even at wide viewing angles

### Major applications

- Smartphones
- LED TV displays
- Computer monitors
- Laptop displays
- Electronic tablets and notebooks
- E-readers
- Electroluminescent displays
- Touchscreen kiosks and ATMs
- Digital cameras
- Aerospace and military applications

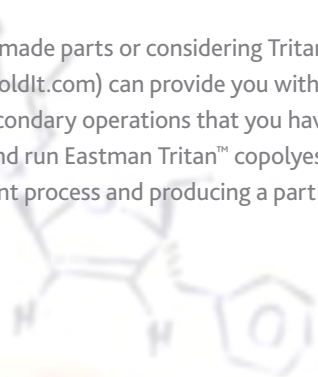


# **Tritan mold it.**

[www.tritanmoldit.com](http://www.tritanmoldit.com)

## If you can imagine it, we'll help you mold it.

Whether you're a seasoned molder of Tritan-made parts or considering Tritan for the first time, the Tritan Technical Information Center (TritanMoldIt.com) can provide you with ideas and engineering solutions. Maybe there are capabilities for secondary operations that you haven't yet discovered. Gain insight into optimizing your machines and run Eastman Tritan™ copolyester in your molds with minimal challenges while achieving an efficient process and producing a part that meets the needs of your customers.



# For the right materials, partner with the right company.

The true brilliance of Eastman polymers and compounds doesn't lie in where you'll find them today. It's where you'll find us tomorrow.

For practical solutions that create new opportunities, brands can count on Eastman for its:

- Scientific pedigree
- Research resources
- Collaborative approach
- Consistent and global manufacturing
- Reliable supply chain
- Commitment to environmental and economic sustainability

That's why you'll find us working with some of the world's most innovative and pioneering brands.

With manufacturing sites across North America, Latin America, Europe, and Asia, we are putting our chemistry to work, improving the quality of life in a material way.

[eastman.com](http://eastman.com)





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