Eastman **SPECTAR**™
copolyester

EASTMAN

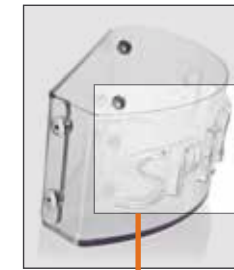
Take advantage of some sweet fabrication features.

With so many options, processing Eastman Spectar™ copolyester can be a treat. Spectar is a plastic resin specifically designed for sheet applications. Sheet extruded from this innovative copolyester can be used as an upgrade to acrylic or polycarbonate in typical graphic, point-of-purchase (POP) displays or visual merchandising applications.

Crystal-clear and flexible, Spectar lets you push the creative envelope many ways. The enclosed Spectar candy dish was created as a sales tool to demonstrate the following processing capabilities:

- Thermoforming
- Routing
- Solvent bonding
- Mechanical fastening
- Heat bending
- Laser cutting
- Flame polishing

Thermoforming



Sheet made from Eastman Spectar™ copolyester is excellent for reproducing mold details. Compared to acrylic and other materials, it gives fabricators the ability to create highly intricate shapes.

- Typical mold constructions are aluminum, MDF board, and plaster.
- Use a minimum draft angle of 5° in male molds for easy part release.
- Use lower oven temperatures than necessary for acrylic or polycarbonate. A good range for oven temperature is 400° to 480°F.
- Unlike other plastics, Spectar does not need to be predried prior to thermoforming!
- Heat the sheet to 275° to 310°F. Use higher temperatures for deep-drawn parts and high detail. Use lower temperatures for large parts and shallow draws. The optimum is 300°F when using a top-sided heat oven and measuring the top part of the sheet.
- Use a vacuum of 508 mm (20 in.) Hg or greater.
- For highly detailed molds, a light dusting with talcum powder helps the part release more easily and will extend the life of the mold as well.
- Always allow generous radii on internal corners—2 X or more than the initial sheet thickness.

Visit our Visual Merchandising Technical Center at www.eastman.com/spectar to see thermoforming in action.

Routing

Standard single- and double-upspiral bits with polished flutes for plastic materials give good results when routing sheet made of Spectar.

- Vibration must be minimized or eliminated.
- Chips formed during the cutting process must be removed from cutting area efficiently.
- Use router bits with highly polished flutes.
- Compressed air can be used to aid in chip removal and cool down the cutting bit.
- Rough cutting spindle RPMs range from 18,000–38,000 with feed rates of 118–314 in./min (3–8 m/min).
- Higher spindle RPMs (28,000–38,000) show better results for single-tooth cutters.
- Lower spindle RPMs (18,000–24,000) show better results for double-tooth cutters.
- The higher the cutting speed, the smoother the surface will be.
- Single- or double-cutting upspiral cutter is preferred.

You can view a video on sawing and routing on our Visual Merchandising Technical Center at www.eastman.com/spectar.

Solvent bonding

Spectar's excellent chemical resistance allows for its use in certain applications where other plastic materials might be unsuitable. Spectar can be solvent bonded with good results by following the right technique. Typical solvents used are methyl ethyl ketone (MEK), tetrahydrofuran (THF), cyclohexanone, methylene chloride, ethyl acetate, and blends of MEK and methylene chloride.

- Parts should be properly machined; edges adequately prepped.
- Make smooth cuts to ensure a tight fit along the entire edge of the bonding area.
- If using a router bit, a straight flute is recommended.
- Use a fixture to align or hold parts securely.
- Apply only enough solvent to cover the entire joint without excess.
- Make sure the solvents are within their use-by-date and protect solvents from absorbing moisture.
- Use a 22-gauge syringe or smaller to enhance capillary action.
- Apply slight pressure to parts to eliminate bubbles at the joint.
- Allow sufficient time for curing.

You can see solvent bonding in action on our Visual Merchandising Technical Center at www.eastman.com/spectar.

Mechanical fastening

Mechanical fastening is a process that joins materials with screws, rivets, or bolts.

- Because of its outstanding toughness, sheet of Spectar accepts mechanical fastening more readily than some other materials.
- Mechanical fastening is helpful if the materials being joined expand and contract at different rates and when assembling or installing large or heavy parts.
- Allow for thermal expansion and contraction by drilling oversized holes. Inserts are not recommended where expansion and contraction may occur.
- The use of washers is suggested when bolting for better load distribution.
- Be sure not to overtighten screws.

Heat bending

When heated, Spectar is very pliant, yet retains its strength in its new position when cooled.

- When hot bending, an electric strip heater with optimum sheet temperature of 107°C (225°F) may be used.

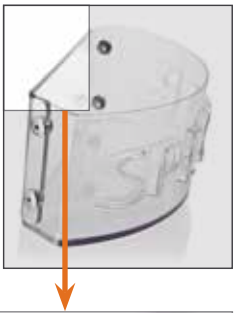
Laser cutting

Sheet made from Eastman Spectar™ copolyester can be laser cut with a few setting modifications from those typically used for acrylic.

- Laser cutting settings for acrylic require higher wattage, high frequency (pulses per second), and less air assist as compared to Spectar of similar thickness.
- The focal point of the laser beam should be set at the middle of the material thickness to minimize the beam divergence.
- The gas pressure needs to be adjusted depending on the cutting speed and the thickness of the material.
- Cut with protective masking in place to avoid buildup of vapor on cut surfaces.
- When designing the path of the laser, avoid having the laser beam pass two or more times over the same cut.
- When cutting sharp corners, do not start the laser at the corner because it increases the heat-affected zone and internal stress in the material.
- The laser starting point should be some distance away from the final cutting edge with the laser following a circular-shaped path towards the final cutting edge.

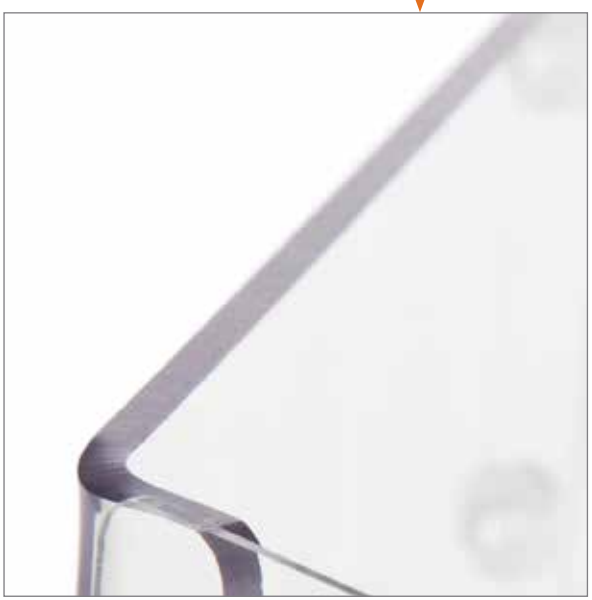
To see more about laser cutting, visit www.eastman.com/spectar.

Flame polishing



Flame polishing is a method that gives shine to the edge of a plastic material by exposing it to a flame or heat. Sheet made from Spectar can be easily flame polished for beautiful results.

- With PETG, it is important to use a lower-temperature flame and quicker passes than typically used with acrylic because of PETG's lower-softening temperature.
- Use a standard handheld torch that emits a flame of 150°F to 250°F. Standard butane torches, propane torches, or hot nitrogen welders work well.
- Keep accurate control of the distance between the sheet and the heat source—otherwise bubbling or distortion can occur.
- Keep the flame moving; do not dwell on one spot.
- Thicker gauge sheet may require an additional step before polishing. Round the edge of the sheet, or deburr. This step improves material distribution when polishing.



For specific instructions on how to process Spectar for the best results, contact your Eastman representative or visit www.eastman.com/spectar.

EASTMAN

Eastman Chemical Company
Corporate Headquarters
P.O. Box 431
Kingsport, TN 37662-5280 U.S.A.

Telephone:
U.S.A. and Canada, 800-EASTMAN
(800-327-8626)
Other Locations, (1) 423-229-2000
Fax: (1) 423-229-1193

Eastman Chemical Latin America
9155 South Dadeland Blvd.
Suite 1116
Miami, FL 33156 U.S.A.

Telephone: (1) 305-671-2800
Fax: (1) 305-671-2805

Eastman Chemical B.V.
Fascinatio Boulevard 602-614
2909 VA Capelle aan den IJssel
The Netherlands

Telephone: (31) 10 2402 111
Fax: (31) 10 2402 100

Eastman (Shanghai) Chemical Commercial Company, Ltd.
Jingan Branch
1206, CITIC Square
No. 1168 Nanjing Road (W)
Shanghai 200041, P.R. China

Telephone: (86) 21 6120-8700
Fax: (86) 21 5213-5255

Eastman Chemical Japan Ltd.
MetLife Aoyama Building 5F
2-11-16 Minami Aoyama
Minato-ku, Tokyo 107-0062 Japan

Telephone: (81) 3-3475-9510
Fax: (81) 3-3475-9515

Eastman Chemical Asia Pacific Pte. Ltd.
#05-04 Winsland House
3 Killiney Road
Singapore 239519

Telephone: (65) 6831-3100
Fax: (65) 6732-4930