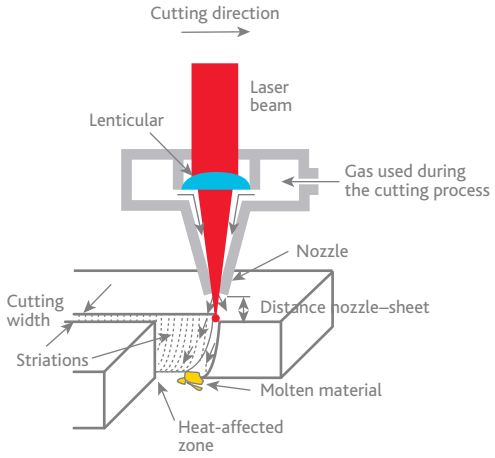
EASTMAN

Eastman Spectar™ copolyester
Laser cutting process

Laser cutting Eastman Spectar™ copolyester is accomplished by the absorption of highly focused laser energy by the material, whereby the longer wavelength of laser light is converted into heat. The heat generated through this process produces a localized melting of the material (melt shearing process) and/or vaporizing of the material (sublimation process). The molten material and/or the vaporized material are forced away from the cutting section by a gas/air jet which acts coaxial to the laser beam.



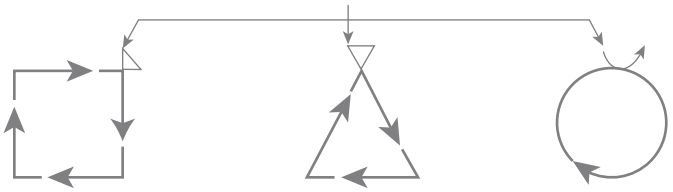
Processing parameters for laser cutting

The laser power and cutting speed needs to be adjusted according to the sheet thickness. In general, the power is increased for thicker sheet, while reducing the cutting speed at the same time. It is suggested to keep the frequency as high as possible (> 1 kHz) as the pulsing effect will produce striations on the surface (rough surface). Operating at high laser power (> 1000 W) can result in material degradation and yellowing of the sheet when the cutting speed is not optimized. Best cutting quality is achieved by minimizing output wattage of the laser at a given sheet thickness and maximizing cutting speed. Examples of CO_2 laser settings are given in the table as a reference starting point for various sheet thicknesses. It is recommended that each customer performs their own testing to identify settings that work best for their specific equipment.

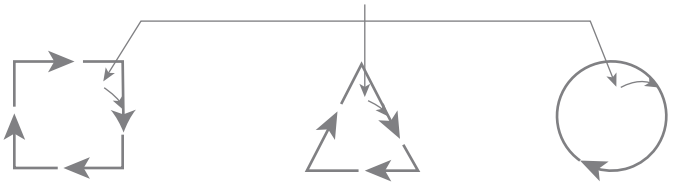
	Eastman Spectar™ copolyester		
Gauge, mils (inches)	118 (⅛)	177 (3⁄16)	236 (¼)
Power (watts)	150	150	200
Speed (inches/min)	88	60	50
Frequency (Hz)	6,000	7,000	20,000
Cut height (inches)	–0.01	–0.03	–0.1
Air pressure (psi)	50	50	50

- Lenses: Laser cutting devices have typical focal lengths of 1.5″, 2.5″, 5″, or 7.5″. Generally, the thicker the sheet the higher the focal length of the lens. The focal point of the laser beam should be set at the middle of the material thickness to minimize the beam divergence.
- Assisting gas: The coaxial gas/air jet removes the molten and/or vaporized products generated during the cutting process and protects the lens from being contaminated. 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 that the laser beam passes two or more times over the same cut.
- When cutting shapes with sharp corners, do not start the laser path at the corner because this will increase the heat-affected zone and therefore the 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.

Laser starting point when cutting various shapes from a sheet



Laser starting point when cutting various shaped holes in a sheet



Laser cutting Eastman Spectar™ copolyester is an effective method for creating intricate, precisely fabricated pieces, where edges are glossy and polished. For technical assistance or more information, contact Eastman Specialty Plastics, Technical Service at 1-800-EASTMAN.

EASTMAN

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Material 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.

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