

# Cutting

## Battery Foil Cutting

Lithium ion batteries can be found everywhere from phones and laptops to electric cars. The automotive industry is set to increase its demand for these batteries drastically in years to come. This means the manufacturing process will need to adapt in order to keep pace with that demand.

Lithium ion batteries consist of electrode coated foils tightly packed into cells. These foils are made from aluminum and copper that act as cathode and anodes. The metallic foils are also coated with carbon based material, with lithium based oxides on the cathodes, which makes them more challenging to cut. The foils are typically only 0.008-0.015mm but with coatings the total material thickness can be >0.2mm.

Traditional manufacturing methods use a mechanical cutter, which can become blunt, damage the foil and reduce cut quality. The entire process must then stop to replace the blade. SPI's G4 200W EP-Z fiber laser is virtually maintenance free which means minimal running costs and indefinitely consistent cutting results. Pairing this laser with a galvanometer scanner creates a non contact system which causes no damage to the surrounding material and can cut unconventional shapes if required.

The challenge with cutting battery foil is that if any burrs are present they can create a short circuit, damaging the cell. With the use of long pulse durations and multi pass processing, this system can achieve high quality results with minimal burring in a faster processing time than alternative methods. Average cutting speed is between 1m/s up to 2.5m/s depending on the exact foil material configuration.

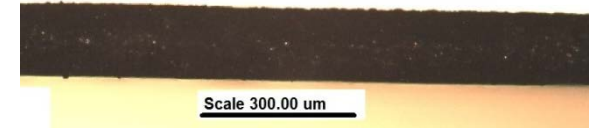
### Application Parameters

Type	redENERGY G4 200W EP-Z
Power	200W
M <sup>2</sup>	>1.6
Beam Ø	10mm
Scanner/Lens	163mm lens
Energy	WF39, 300kHz @~4m/s

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