

Technical Data for Photomachining Challenge

Insulated wire

The wire is 75 microns, or 3 mil in diameter total for polyimide and Cu. The core wire is about 50 microns with the insulation being about 12.5 microns around the wire, for the total diameter above. The insulation is polyimide.

Excimer laser

KrF laser, 200 Hz max rep rate, about 250 mJ per pulse, so 50W total max power, beam shape is about 1cm x 2 cm. The output is not Gaussian; the beam is wide and not coherent. The laser aperture (or a mask in front of the aperture) is imaged onto the target.

CO₂-TEA laser

150 Hz maximum rep rate, about 400 mJ/pulse, so 60W, beam shape is about 15 mm x 15 mm. The output is not Gaussian; the beam is wide and not coherent. The laser aperture (or a mask in front of the aperture) is imaged onto the target.

Material data

Polyimide ablates at a fluence (energy density) starting about 1 J/cm².

Copper:

- at 248 nm, around 10 J/cm² fluence will affect the copper
- at 10.6 μm, copper is 98% reflective