Abstract Submitted
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Optimizing target surfaces for inertial confinement fusion experiments using micro-electrical discharge machining[1] C. WALTZ, Michigan State University, J.J. JAQUEZ, General Atomics — Cone guided fast-ignition laser fusion uses a re-entrant cone target to allow laser access through the plasma overlying the compressed core. Current experiments emulate that situation with a conical hole in an aluminum foil. It is critical that the 10 μm diameter laser spot be centered on the 30 μm diameter flat cone tip. Alignment is achieved by retro-imaging a low power beam from the cone tip. Micron scale roughness on the cone tip limits its reflected light intensity making alignment difficult; an improved surface finish is required. The buried cone targets are fabricated by micro-electrical discharge machining (EDM). Various parameters are investigated to decrease the roughness and to improve the uniformity of the EDM cone tip surface: EDM wire material and shape, electrode voltage, machine capacitance, and machining speed. Results of surface roughness, uniformity, and material removal rate will be presented.

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